

FILE FOLDER

DESCRIPTION ON TAB:

Wildlife Mgt. Plan

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PLANS, SPECIFICATIONS, AND ESTIMATES

A. NAME OF PROJECT: Study of the Effects of Artificial Nest Boxes Upon Wood Duck Reproduction at Camp Lejeune, North Carolina

B. WORK PLANNED:

1. Objectives: To establish colonies of nesting wood ducks through the erection of artificial nest boxes; to collect and analyze nest box utilization data; to study movements and migrations of wood ducks so as to gain insight into possible future management techniques applicable to wood ducks.

2. Job Titles: Construction of Nest Boxes
Selection of Nest Box Erection Sites
Erection of Nest Boxes
Collection and Analysis of Nest Box Utilization Data
Nest Box Maintenance
Trapping and Banding

C. SUPERVISION:

1. Leader: Wildlife Technician Charles Peterson, Camp Lejeune, N. C.

2. Assistance and Cooperation: N. C. Wildlife Resources Commission
U. S. Fish and Wildlife Service
Camp Lejeune Rod and Gun Club

D. SUMMARY OF COSTS:

1. Expenditures:

40 completed nest boxes	\$120.00	\$45.00
Aluminum step ladder	15.00	
Nest box signs	20.00	10.00
Total Expenditures	\$155.00	\$55.00

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1. Objectives: To establish colonies of nesting wood ducks through the erection of artificial nest boxes; to collect and analyze nest box utilization data; to study movements and migrations of wood ducks so as to gain insight as to possible future management techniques applicable to wood ducks.

2. Job Tasks: Construction of Nest Boxes; Selection of Nest Box Location Sites; Location of Nest Boxes; Collection and Analysis of Nest Box Utilization Data; Nest Box Maintenance; Reporting and Summary.

3. Location: Wildlife Research Center, Camp Lejeune, N. C.

4. Personnel: U. S. Fish and Wildlife Service; Camp Lejeune PWS and SWS Staff

5. SUMMARY OF COSTS:

6. Estimated Total Project Cost: \$150.00
7. Estimated Annual Cost: \$150.00
8. Total Expenditures: \$150.00

WORK PLANS

WORK PLAN I	CONSTRUCTION OF NEST BOXES
WORK PLAN II	SELECTION OF NEST BOX ERECTION SITES
WORK PLAN III	ERECTION OF NEST BOXES
WORK PLAN IV	COLLECTION AND ANALYSIS OF NEST BOX UTILIZATION DATA
WORK PLAN V	NEST BOX MAINTENANCE
WORK PLAN VI	TRAPPING AND BANDING

WORK SHEET

DESCRIPTION OF WORK

DATE OF WORK

LOCATION OF WORK

NAME OF PERSONS CONCERNED

REMARKS

DATE

WORK SHEET
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JOB OUTLINE

WORK PLAN I

CONSTRUCTION OF NEST BOXES

Objective: To construct ^{fifteen} ~~forty~~ artificial wood duck nest boxes.

Procedure:

1. Nest boxes will be constructed of one-inch rough cut cypress lumber and will have inside measurements of 10" x 10" x 24".
2. Nest boxes will be equipped with removable tops to facilitate data collection and nesting material maintenance.
3. Entrance holes will be round - four inches in diameter.
4. Galvanized nails will be used throughout construction.
5. Each nest box will have an informational sign attached, worded as follows:

**WOOD DUCK NEST BOX PROJECT
Help Conserve Wildlife
DO NOT DISTURB**

Schedule: Year-round

Location: Green-tree impoundment, ponds and streams

Assignment: Camp Lejeune Rod and Gun Club

Prepared by: ~~Charles Peterson~~ Fish and Wildlife Committee

DESCRIPTION OF TEST BOXES

1. Each test box will be constructed of one-inch rough cut plywood lumber

Procedure:

and will have inside measurements of 10" x 10" x 24".

2. Test boxes will be equipped with removable cover for facilitating data collection and nesting material maintenance.

3. Entrance holes will be round - four inches in diameter.

4. Galvanized nails will be used throughout construction.

5. Each test box will have an identification sign attached, worded as follows:

WOOD TEST BOX NUMBER

DATE CONSTRUCTION

NO. OF DISTRICTS

Signature: [illegible]

Location: [illegible]

Assignment: [illegible]

Prepared by: [illegible]

JOB OUTLINE

WORK PLAN II

SELECTION OF NEST BOX ERECTION SITES

Objective: To select suitable sites for the erection of artificial wood duck nest boxes.

Procedure:

1. Nest box erection sites will be selected in each of three potential nesting types - fresh water ponds, impoundments, and streams.
2. General surrounding habitat suitability, nearness of suitable rearing areas, past sightings of breeding wood ducks, and the likelihood of human and/or predator intrusion will be considered during site selection.
3. Nest box erection sites will be selected by mid-January.

Schedule: January

Location: Green-tree impoundments, ponds, and streams

Assignment: Wildlife Technician

Prepared by: Charles Peterson Fish and Wildlife Committee

SELECTION OF WEST BOX ERECTION SITES

Objective: To select suitable sites for the erection of electrical substations and busbar boxes.

Procedure:

1. West box erection sites will be selected in each of three potential loading types - fresh water power, hydroelectric, and steam.
2. General surrounding habitat suitability, presence of suitable trees, and the likelihood of erosion and/or weather intrusion will be considered during site selection.
3. West box erection sites will be selected by mid-January.

Responsible: [Illegible]

Location: [Illegible]

Assignment: Wildlife Technician

Prepared by: Charles Peterson

JOB OUTLINE

WORK PLAN III

ERECTION OF NEST BOXES

Objective: To properly erect forty wood duck nest boxes at previously selected sites.

Procedure:

1. No more than three or four nest boxes will be initially erected at any one site with the exception of the green-tree impoundment.
2. The boxes will be mounted on cedar posts facing away from the shoreline. Predator shields will be installed on all posts on which boxes are erected.
3. A three-inch layer of sawdust and shavings will be placed in the bottom of each nest box.
4. Nest boxes will be erected by the end of January.

Schedule: January

Location: Green-tree impoundment, ponds and streams

Assignment: Wildlife Technician

Prepared by: Charles Peterson Fish and Wildlife Committee

JOB OUTLINE

WORK PLAN XIX

ERECTOR OF WEST BONES

Objective: To properly erect heavy wood framework as previously selected sites.

Procedure:

1. No more than three or four mast boxes will be initially erected at any one site with the exception of the cases noted hereafter.
2. The boxes will be mounted on cedar posts facing away from the shoreline. Predator shields will be installed on all posts on which boxes are erected.
3. A three-inch layer of sawdust and shavings will be placed in the holes of each mast box.
4. Mast boxes will be spaced by the amount shown.

Location: January

Location: December

Location: November

Location: October

JOB OUTLINE

WORK PLAN IV

COLLECTION AND ANALYSIS OF NEST BOX UTILIZATION DATA

Objective: To collect, record and analyze all pertinent data with respect to nest box location and utilization.

Procedure:

1. Each nest box will be checked every two weeks between March 1 to August 1.
2. Each box will be numbered, and records will be kept for each box including erection date, immediate habitat description, number and dates of nesting attempts, and number and dates of successful hatches.
3. Data records will be analyzed and kept current.

Schedule: March 1 to June 1

Location: Camp Lejeune

Assignment: Wildlife Technician

Prepared by: ~~Charles Peterson~~ Fish and Wildlife Committee

COLLECTION AND ANALYSIS OF TEST FOR THE BOSTON AREA

1. The test will be checked every two weeks between March 1 to May 1, 1971.

2. Each box will be numbered, and records will be kept for each box including execution date, immediate father's identification number and name of testing agency, and number and name of immediate relative.

3. Test records will be analyzed and reported to the test agency.

4. The test will be reported to the test agency.

5. The test will be reported to the test agency.

6. The test will be reported to the test agency.

JOB OUTLINE

WORK PLAN V

NEST BOX MAINTENANCE

Objective: To maintain nest boxes so that they will be attractive to wood ducks.

Procedure:

1. Each nest box will have one maintenance check prior to the wood duck nesting season.
2. Any squirrel or bird nests will be removed, and original nesting material will be replaced if necessary.
3. Any necessary nest box repairs will be made.

Schedule: December

Location: Camp Lejeune

Assignment: Wildlife Technician

Prepared by: Charles Peterson Fish and Wildlife Committee

WEEK PLAN V

WEST FOR MAINTENANCE

Collectors: To maintain nest boxes so that they will be attractive to wood ducks.

Procedure:

1. Each nest box will have one entrance hole placed above the wood duck nesting chamber.

2. Any squirrel or bird nests will be removed, and original nesting material will be replaced if necessary.

3. Any necessary nest box repairs will be made.

Approved: _____

Accepted: _____

Witness: _____

Checked by: _____

JOB OUTLINE

WORK PLAN VI

TRAPPING AND BANDING

Objective: To trap and band ducks in the vicinity of nest box study areas so as to gain information as to movements, migrations, and habits of wood ducks.

Procedure:

1. Duck trapping operations will be conducted after the hunting season in the vicinity of the nest box study areas.
2. Incubating hen wood ducks will be banded during the last week of incubation.
3. Duck banding records will be analyzed and kept current.

Schedule: January 10 - June 1

Location: Camp Lejeune

Assignment: Wildlife Technician

Prepared by: Charles Peterson Fish and Wildlife Committee

JOB DESCRIPTION

WORK AREA

TRAINING AND EXPERIENCE

Operator to read and hand check in the vicinity of nest box areas as to gain information as to nest status, migration, and habits of wood ducks.

Responsibilities

1. Hand checking operations will be conducted after the nesting season in the vicinity of the nest box areas.

2. Inspecting nest wood ducks will be handled during the last week of incubation.

3. Nest banding records will be analyzed and kept current.

Education

High School Graduate

Assessment: Wildlife Technician

Preferred: Wildlife Technician

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WILDLIFE MANAGEMENT PLAN
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
MARCH 1968

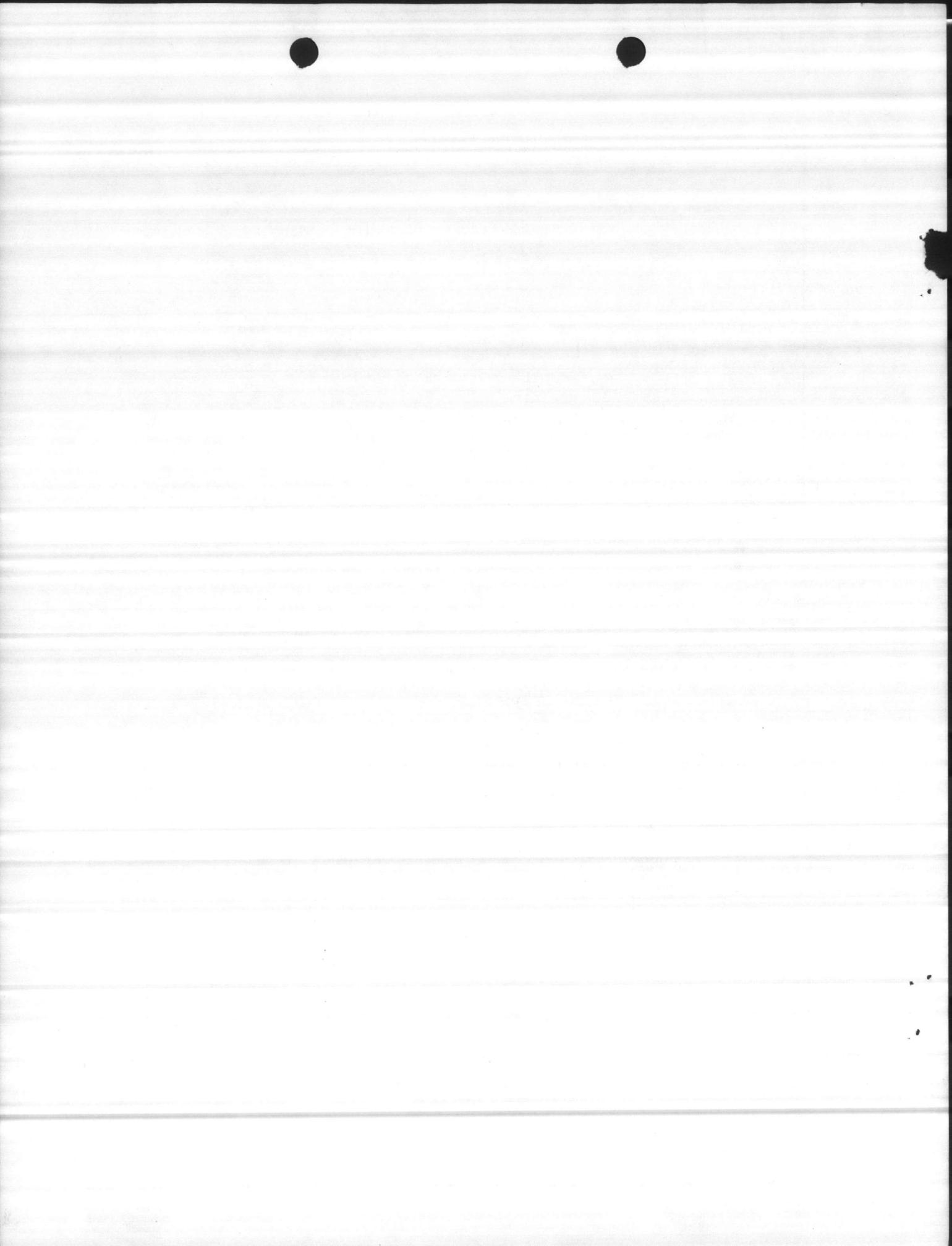


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SECTION I
GENERAL

1. Purpose. This plan contains information relating to the scientific management of wildlife which will serve as a guide to insure sustained annual crops of game for recreational use.

2. Objectives

a. To provide more outdoor sport through hunting, fishing, and related recreational interests for more people with an equal opportunity to enjoy them.

b. To encourage and give incentive to personnel for using the recreational benefits relating to wildlife.

3. Description of Area. The Marine Corps Base, Camp Lejeune, North Carolina, is on the Atlantic Seaboard approximately 50 miles north of Wilmington, North Carolina, and covers 173.86 square miles. There are 85,154.91 acres of land and 26,000 acres of water. The perimeter measures approximately 68 miles.

Camp Lejeune is bordered on the east by approximately 14 miles of ocean front. The Intracoastal Waterway traverses the base to the extent of nearly 15 miles along the eastern perimeter. Numerous tidal creeks empty into New River which extends inland from the ocean.

a. Soils. The soil type of this "coastal plain" country is generally classified as sandy loam. Some of the soil is low in organic matter and low in fertility, but most of the land produces abundant crops of timber and foods for wildlife.

b. Topography. Surface relief ranges from flat (marsh areas immediately adjacent to tidal creeks) to slightly rolling. The land is laced with deep wooded forests on the better upland range to inaccessible bottom-land swamps and pocosins.

The terrain adjacent to the numerous small ponds and marsh areas is flat and woodlands extend to the very edge of ponds and marshes. The highest ridges are generally located through the central portion of the area. Principal watershed drainage areas are New River, Northeast Creek, Southwest Creek, French Creek, Bear Creek, and Duck Creek.

c. Climate. The climate ranges from long hot summers to mild winters. Average monthly precipitation and temperatures are illustrated in Figures 1 and 2. The average annual precipitation is approximately 47 inches. The average yearly temperature is 61° and the growing season is approximately 230 days. Severe tropical storms sometimes move up the coast and cause varying amounts of damage to wildlife.

Figure 1. Average Monthly Rainfall

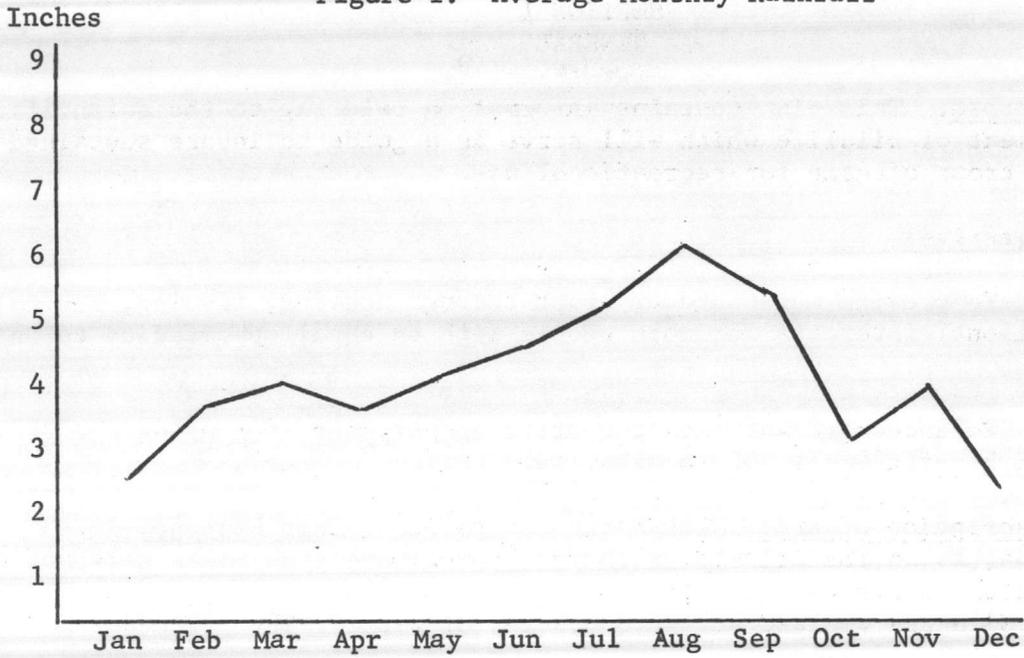
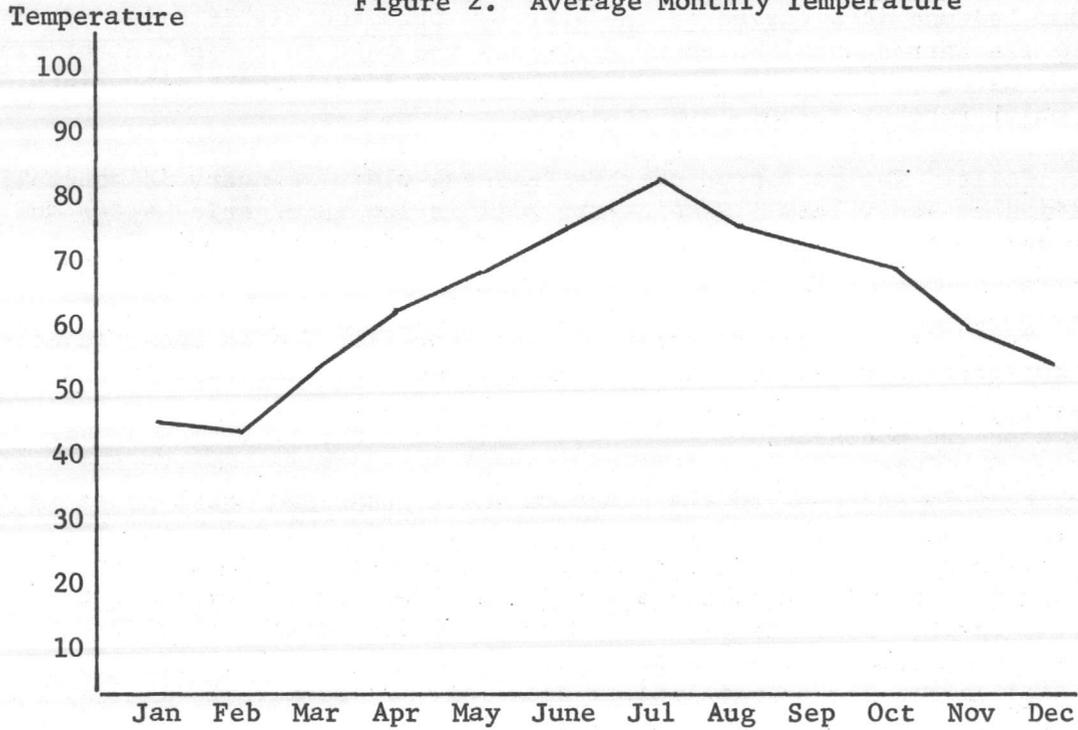


Figure 2. Average Monthly Temperature



d. Vegetation. Native plants common to Camp Lejeune that are useful to wildlife are listed below:

Trees

White Oak (Quercus Alba)
Live Oak (Q. Virginiana)
Black Oak (Q. Velutina)
Red Oak (Q. borealis)
Turkey Oak (Q. laevis)
Water Oak (Q. Nigra)
Yellow Poplar (Liriodendron tulipifera)
Sweet Gum (Liquidambar styraciflua)
Red Maple (Acer rubrum)
Holly (Ilex opaca)
Black Gum (Nyssa sylvatica)
Hornbeam (Ostrya Virginiana)
Longleaf Pine (Pinus palustris)
Loblolly Pine (P. taeda)
Sweet Bay (Magnolia Virginiana)
Dogwood (Cornus florida)
Sassafras (Sassafras albidum)
Persimmon (D. Virginiana)
Sourwood (Oxyolendrum arboreum)
Cypress (Taxodium distichum)
Ash (F. Nigra)

Shrubs

Wax Myrtle (Myrica Cerifera)
Gallberry (Ilex Glabra)
Red Bay (Persea pubescens)
Cyrilla (Cyrilla vacemiflora)

Vines and Herbs

Partridge Pea (Cassia spp.)
Beggar Lice (Desmodium spp.)
Lespedeza (Lespedeza spp.)
Milk Pea (Galactia volubile)
Grape (Vitis spp.)
Blueberries (Vaccinium spp.)
Simlax (Simlax spp.)
Honeysuckle (Lonicera japonica)

e. Military Use. Camp Lejeune houses three Marine commands and two Navy commands: Marine Corps Base; Force Troops, FMF Atlantic; 2d Marine Division, FMF; U. S. Naval Hospital; and Naval Medical Field Research Laboratory.

Its mission is to provide housing, training facilities, logistical support and certain administrative support for Fleet Marine Force units and other units assigned; to conduct specialized schools and other training as directed; to receive, process and conduct combat training as directed for personnel to be assigned to replacement units; to organize replacement units for shipment overseas as directed; and to provide logistic support to other Marine Corps activities as directed.

4. History

a. Camp Lejeune has had a program of wildlife management in effect for many years. Actual field work for the program began in 1944, but plans were not put into effect until two years later. Administrators and participants of the early program found it necessary to experiment in properly establishing the most desirable types of wildlife plantings for the area. Their findings placed the program in the proper perspective and helped make the present management techniques more complete.

b. Cooperation with state and federal wildlife officials is excellent in every respect of the wildlife management program. The Cooperative Plan (Table A) has been formulated with state and federal wildlife officials to benefit the management, development, research, and enforcement aspects of the wildlife program. A Committee for Conservation of Natural Resources (Table B) has been established to assist and advise the Commanding General in implementing the provisions of the Secretary of the Navy instructions on conservation and management of the fish and wildlife resources of Camp Lejeune.

5. Wildlife Resources

a. Camp Lejeune affords large areas which can be used for hunting, fishing, and other outdoor activities. No hunting areas include housing areas, built-up areas and impact areas. Hunting is allowed in buffer zones near impact areas when firing is secured. (Table C)

b. Fisheries management practices are in effect in eight fresh water ponds. These lakes vary in size from one-half to three acres with a total of 12 acres under management. These are shallow natural lakes which were of low fertility and productivity when reclaimed.

c. Wildlife species most common to Camp Lejeune:

Game Birds and Animals

Whitetail Deer (Odocoileus Virginianus)
Black Bear (Ursidae Americanus)
Squirrel (Sciurus spp.)
Rabbit (Sylvilagaos spp.)
Red Fox (Vulpes Fulva)
Gray Fox (Urocyon Cinereorgenteus)
Quail (Colinus Virginianus)
Turkey (Meleagris Gallopardo)

Fur Bearing Animals

Mink (Mustela Vison)
Otter (Lutra Canadensis)
Muskrat (Ondatra Zibethica)
Skunk (Mephitis Mephitis)
Raccoon (Procyon Lotor)
Opossum (Didelphis Virginiana)
Bobcat (Lynx Rufas)

Migratory Game Birds

Dove (Zenaidura Macoura)
Snipe (Capella Delicata)
Woodcock (Philohela Minor)
Rail (Rallus Longirostris)
Wood Duck (Aix Sponsa)
Black Duck (Antilope Cervicapra)
Canada Goose (Branta Canadesis)
Mallard (Anas Platyrhynchos)
Green-Winged Teal (Anas Carolinense)
Ruddy Duck (Oxyura Jamaicensis)
Hooded Merganser (Lophodytes Cucullatus)
American Merganser (Mergus Merganser Americanus)
Red-breasted Merganser (M. Serrator)
Canvasback (N. Valisineria)
Bufflehead (Bucephala Albeola)
Lesser Scaup (Aythya Affinis)
Pintail (Anas Acuta)
Greater Scaup (Aythya Marila)
Ring-Neck Duck (Aythya Collaris)
Coot (Fulica Americana)

Game Fish

Bass (Micropterus Salomides)
Blue Gill (Lepomis Macrochirus)
Redbreast (Lepomis Auritus)
Pickeret (Esox spp.)
Redear (Lepomis Microlophus)
Warmouth (Chaenobryttus Gulosos)
Black Crappie (Pomoxis Nigromaculatus)
Yellow Perch (Perca Flavescens)
Pumpkinseed (Lepomis Gibbosus)
Flier (Centrachus Macropterus)
Stripped Bass (Roccus Saxatilis)

Non-Game Fish

Carp (Cyprinus Carpio)
Bowfin (Amia Calva)
Shad (Dorosoma Cepedianum)
Catfish (Ictalurus spp.)
Garfish (Lepisoteus Osseus
Linnaeus)

Many other species of migratory bird life frequents Camp Lejeune which cannot be hunted but contribute to the study of bird watching.

d. Population density and range condition:

<u>Species</u>	<u>Population</u>	<u>Range</u>
Whitetail Deer	2,600	Good
Black Bear	15	Fair
Squirrel	Plentiful	Good
Rabbit	Scarce	Fair
Red Fox	Scarce	Fair
Grey Fox	Excessive	Excellent
Quail	Plentiful	Fair
Turkey	270	Good
Mink	Plentiful	Excellent
Otter	Plentiful	Excellent
Muskrat	Scarce	Fair
Skunk	Excessive	Excellent
Raccoon	Excessive	Excellent
Opossum	Plentiful	Excellent
Bobcat	Plentiful	Excellent
Dove	Scarce	Fair
Rails	Plentiful	Excellent
Duck	Plentiful	Good

6. Potential Development

a. Since wildlife populations are primarily dependent on woodlands for food and cover, forestry practices must be programmed to provide optimum conditions for habitat improvement. Silvicultural practices and activities which are unnecessarily destructive to wildlife habitat should be modified and reduced. Woodlands should not be planted or allowed to grow to single species.

b. Population levels will depend upon such factors as quantity and quality of food and cover, water resources, productivity and composition and condition of stock; population levels and their relationship to

capacity of the range to support a given population; mortality factors such as predation, disease and removals through hunting.

c. Projected plans include the development of a salt marsh impoundment for waterfowl and fresh water fisheries management, an additional green tree impoundment for waterfowl, construction of a 200 acre lake on Wallace Creek, and establishing 16 more sites for wildlife plantings.

d. The Camp Lejeune hunting and fishing regulations are established in conjunction with state and federal regulations relating to the taking of wildlife.

7. Responsibilities. Implementation of the wildlife management program is the primary responsibility of the Wildlife Technician and the Base Forester. These responsibilities include establishing hunting quotas, hunting and fishing regulations, sale of base hunting and fishing permits, habitat development and preservation, predator control and compliance of administrative policies of the Committee for the Conservation of Natural Resources.

SECTION II MANAGEMENT TECHNIQUES

1. Wildlife. The management of game birds and animals will be accomplished by the preservation of natural habitat, manipulation of forestry silvicultural practices, the enforcement of fish and game regulations, and development of annual and perennial plantings for birds and animals.

a. Development. This phase of the program will involve establishing perennial border food and cover plantings adjacent to annual and perennial plantings for small game (quail and rabbits), food plots for large game (deer and turkey), and feeding, resting and nesting areas for migratory birds.

(1) Some small game plantings will consist of perennial seed and seedling plantings of various species of lespedeza (Lespedeza spp.), part-ridge pea (Cassia fasciculata), beggar lice (Desmodium spp.) and other desirable plantings. Seed plantings will be established in spring after the danger of frost, and the seedlings will be planted during the dormant period. Plots will be approximately one-half acre in size and will be fertilized with 400 pounds of 8-8-8 per acre. Shrub lespedeza (Lespedeza bicolor) will be cut back every third year during February with 400 pounds of 8-8-8 per acre applied at the time of cutting.

(2) Other small game plantings will be established adjacent to perennial seed and seedling plantings. These plantings will consist of annual mixtures such as millet (Panicum spp.), milo (Andropogon Sorghum), soybeans (Glycine spp.), buckwheat (Fagopyrum esculentum), cowpeas (Vigna spp.) and other desirable annuals. Fifteen of these plantings will be established in the future. Fertilization rate is 400 pounds of 8-8-8 per acre during planting.

(3) Food plots for large game will also consist of perennial and annual seed plantings. These plantings will be from two to four acres in size. Sixteen new plots will be established in addition to the 47 which presently exist. (Table C). Some food plots for large game will be planted to perennial mixtures of clover (Trifolium spp.) and fescue (Festuca spp.). Annual winter cover crops will be planted consisting of rye (Secale cereale), oats (Avena spp.) and wheat (T. aestivum). Fertilization rates for perennial plantings of clover and fescue will be indicated by soil sample analysis. Annual winter cover crops will be fertilized with 400 pounds of 8-8-8 per acre at the time of planting.

(4) Migratory Birds. Food plantings are established to attract migratory birds during the migration period.

(a) The annual grain plantings that are established for small game are utilized by dove to some extent. Row crop cultivation which are kept relatively free of grass and weeds are essential for dove management. Present seeding application of all plantings is by broadcasting which hinders

heavy utilization by dove. In the event of increased demand for dove hunting areas, cultivated crops of millet and milo will be established.

(b) Waterfowl management will be accomplished by trapping and banding various species of ducks, erection of predator-proof wood duck nesting houses on streams, lakes, and impound areas (Table D) and annual maintenance of the green tree impoundment. The impoundment will be flooded in mid to late September. De-watering will begin in mid to late March which will allow normal tree growth and the appearance of swamp floor flora. This impoundment serves as a feeding, resting and nesting area for migratory wildfowl.

b. Preservation

(1) Natural food and cover retention is of major importance in maintaining the carrying capacity of wildlife that the area will support. Hardwood eradication projects in any timber stand should be discontinued.

(2) Hardwood areas adjacent to branches and small watercourses should be preserved in their natural state or only slightly changed by selective cutting on a strictly controlled basis.

(3) Swamp-type habitat should be preserved in its present condition.

c. Manipulation. Controlled burning is a tool which minimizes the danger of wild fires. This forestry practice is also valuable to modern wildlife management by maintaining optimum conditions for controlling plant succession whereby native legumes, annuals, and tender plants are made available for quail, deer, turkey, and rabbits. A rotation system should be worked out whereby areas could be control-burned every third or fourth year.

d. Research

(1) A limited amount of research is necessary to evaluate the effectiveness of the management program. Reproductive studies, sight counts, track counts, call counts, food habit studies, and seine samples will be conducted to determine population levels.

(2) Spring turkey hunts will be conducted between the mating and nesting season to increase the annual harvest of gobblers and establish a larger harvestable turkey population. Crops, wing tips, spurs, measurements and weights will be collected from each kill for biological study of the flock.

e. Predator Control. A limited trapping program will be conducted to maintain a normal predator-prey relationship. Feral dog and cat populations will also be controlled.

2. Fish Management. Fisheries management is being attempted in eight fresh water lakes. (Table C). All these lakes were of poor quality (low PH and total hardness) when first reclaimed. Continued emphasis will involve the management of these lakes, the management of proposed lake on Wallace Creek, and fisheries management in the proposed salt marsh impoundment. Fresh water lakes will be treated with the following management practices:

a. Fertilization. Several benefits are provided by applying fish pond fertilizer (20-20-5) at the rate of 40 pounds per surface acre from March through September as indicated in Table E.

(1) Lake fertilization produces a "bloom" of plankton algae that prevents the development of filamentous algae and shades out submersed aquatic vegetation.

(2) The microscopic "bloom" produces organisms that are eaten by insect larvae which form the main supply food for small fish, thereby increasing food producing capacity.

b. Chemical Spraying. Various herbicides will be used to control undesirable aquatic vegetation.

c. Feeding. Channel catfish are stocked in three fresh water ponds and are on a feeding schedule. The feeding schedule is determined by the temperature of the water and the average fish weight. (Table F). When the lakes are opened, fishing will be controlled and creel limits sampled to determine the success of the feeding program.

d. Stocking. When lakes are reclaimed, initial stocking will be at the ratio of 150 bass fingerlings to 1,500 bluegill fingerlings. Initial stocking of channel catfish will be 2,000 fingerlings per acre when on a feeding schedule. Secondary stocking will be determined by seine and creel samples.

e. Water Chemistry Studies. All lakes will be sampled periodically to determine the PH, dissolved oxygen and carbon dioxide content, and total hardness. Applications of lime will be made when necessary to keep the fertility of the water at the desired levels.

f. Shoreline Development. The shorelines will be cleared of brush to permit improved access for fishermen and management work. This will invite growth of grass to firm the edges and prevent erosion. Roads into the lakes will be maintained to provide better access for fishermen.



SECTION III
BUDGET

1. Anticipated Long Range and FY 68-69 Budget and Work Plans
 - a. Long Range Work Plan. Table G.
 - b. FY 68-69 Work Plan. Table H.
2. Sources of Funds for FY 68-69.
 - a. Appropriated: \$71,294.00
 - b. Nonappropriated: Sale of hunting and fishing permits - \$4,000.00



TABLE A
COOPERATIVE PLAN

1. The following agencies will be responsible for providing the Installation Commander with technical advice, assistance, and related services in fish and wildlife management:

a. Regional Director, Bureau of Sports Fisheries and Wildlife, U. S. Fish and Wildlife Service, Department of Interior, 620 Peachtree-Seventh Building, Atlanta, Georgia. (Fishery Management Program)

b. Executive Director, North Carolina Wildlife Resources Commission, Box 2919, Raleigh, North Carolina. (Wildlife Management)

(1) North Carolina Wildlife Resources Commission
Mr. Grady L. Barnes, Eastern Refuge Supervisor,
1201 Forest Drive, New Bern, North Carolina 28560

(2) North Carolina Wildlife Resources Commission
Mr. Sam Poole, Wildlife Biologist
507 Darby Avenue, Kinston, North Carolina 28501
(Small Game Management)

(3) North Carolina Wildlife Resources Commission
Mr. Thad Cherry, Wild Turkey Restoration Project Leader,
P. O. Box 683, Sanford, North Carolina 27330
(Wild Turkey Management)

(4) North Carolina Wildlife Resources Commission
Mr. Paul S. Metters, Wildlife Patrolman,
Box 154, Jacksonville, North Carolina 28540
(Matters of Law Enforcement)

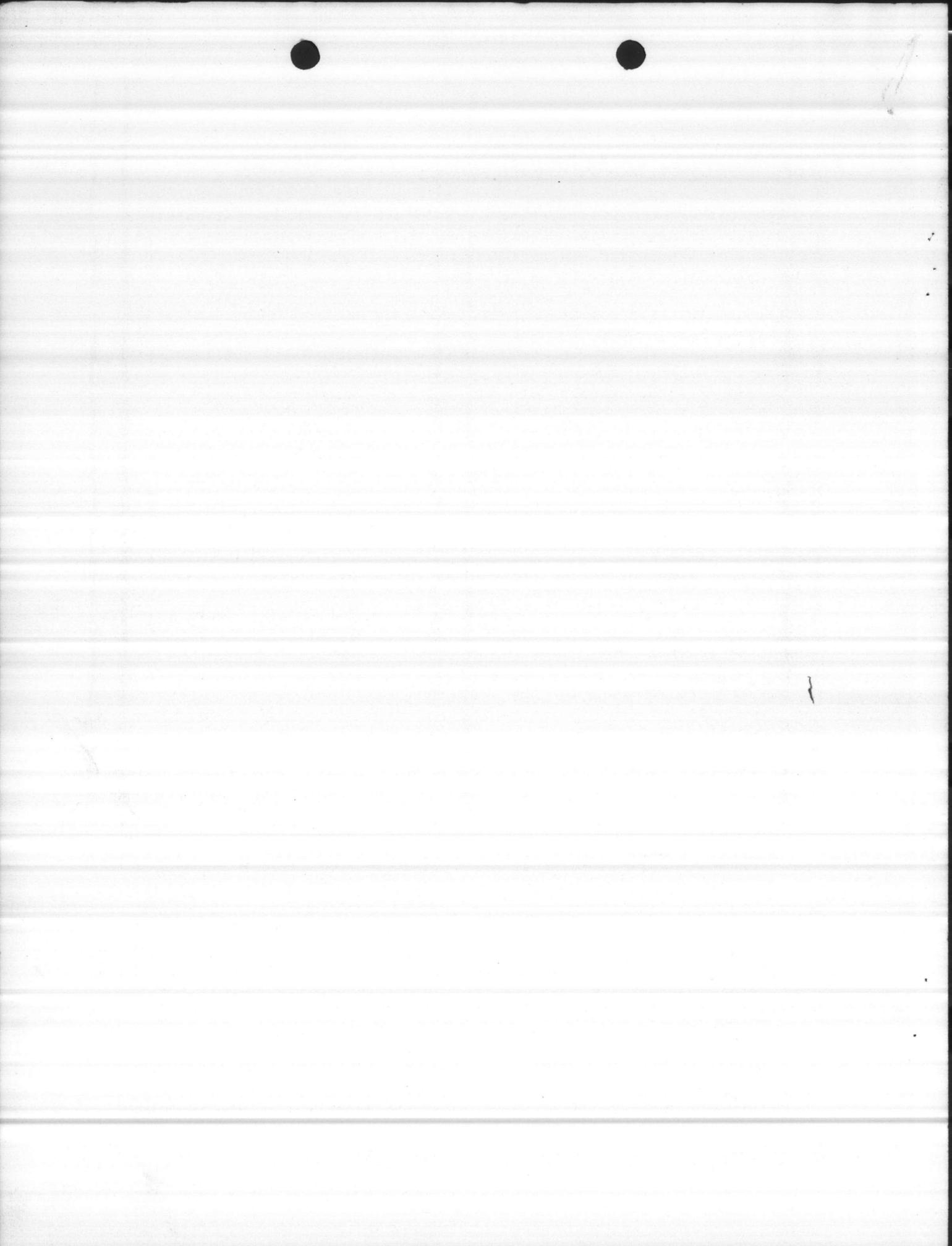


TABLE B
COMMITTEE FOR THE CONSERVATION OF NATURAL RESOURCES

1. General. A Committee for the Conservation of Natural Resources was established in August 1962 to assist and advise the Commanding General in implementing the provisions of the Secretary of the Navy instructions on conservation and management of the fish and wildlife resources of the base.

2. Membership. The committee, chaired by the Assistant Chief of Staff, Facilities, Marine Corps Base, consists of representatives from the 2d Marine Division, FMF; Force Troops, FMF Atlantic; and the following base personnel:

Safety Officer	Forester
Special Services Officer	Security Officer
Informational Services Officer	Range Officer
Maintenance Officer	President, Camp Lejeune Rod and Gun Club
Wildlife Technician	

3. Responsibilities

a. Conduct annually a comprehensive review of the base hunting, fishing, and boating regulations and make recommendations to the Commanding General regarding changes, additions or deletions required.

b. Review recommendations submitted by the Rod and Gun Club regarding organized deer and bear hunts and make appropriate recommendations to the Commanding General regarding same.

c. Prepare annually for the Commanding General's approval a schedule and procedures for the conduct of organized and controlled hunts for all type wildlife.

d. Prepare annually for the Commanding General's approval a schedule for open seasons, bag and creel limits, in consonance with current federal, state and county laws and regulations.

e. After consultation with federal, state and county fish and wildlife authorities and officially chartered conservation agencies, make recommendations to the Commanding General regarding annual harvest of fish and wildlife on the base.

f. Provide command liaison and establish procedures for scheduling and conducting frequent meetings between representatives of federal, state and county fish and wildlife agencies and officially chartered conservation organizations. The committee will take the initiative to seek out help and to work effectively and in harmony with the above agencies and/or organizations. A full report of such meetings will be included in the minutes of the committee.

g. Ensure, when feasible, that local sportsmen groups are invited to sit in meetings of the committee as guests. The importance of establishing, maintaining, and improving base-community relations cannot be overemphasized.

h. Review annually the cooperative plan between the Base; the Regional Director of the U. S. Fish and Wildlife Service; and the Executive Director, North Carolina Wildlife Resources Commission, and make recommendations to the Commanding General for any desirable changes in the plan.

i. Monitor and make frequent reports to the Commanding General concerning all aspects of the Base Wildlife Food Plot Program.

j. Act as command representatives for any inspecting individual or group visiting the base in connection with the Natural Resources Conservation Program.

k. Establish and maintain procedures for accumulating reporting information and prepare all reports for the Commanding General regarding the Base Natural Resources Conservation Program, as required.

l. Develop for promulgation a continuing informational program designed to inform military and civilian persons alike of philosophies, principles, and policies of the Secretary of the Navy as related to the conservation program.

m. Recommend to the Commanding General supplementary instructions, procedures, regulations, etc., regarding any phase or facet of the Natural Resources Conservation Program, as required.

TABLE C
Management Area Map

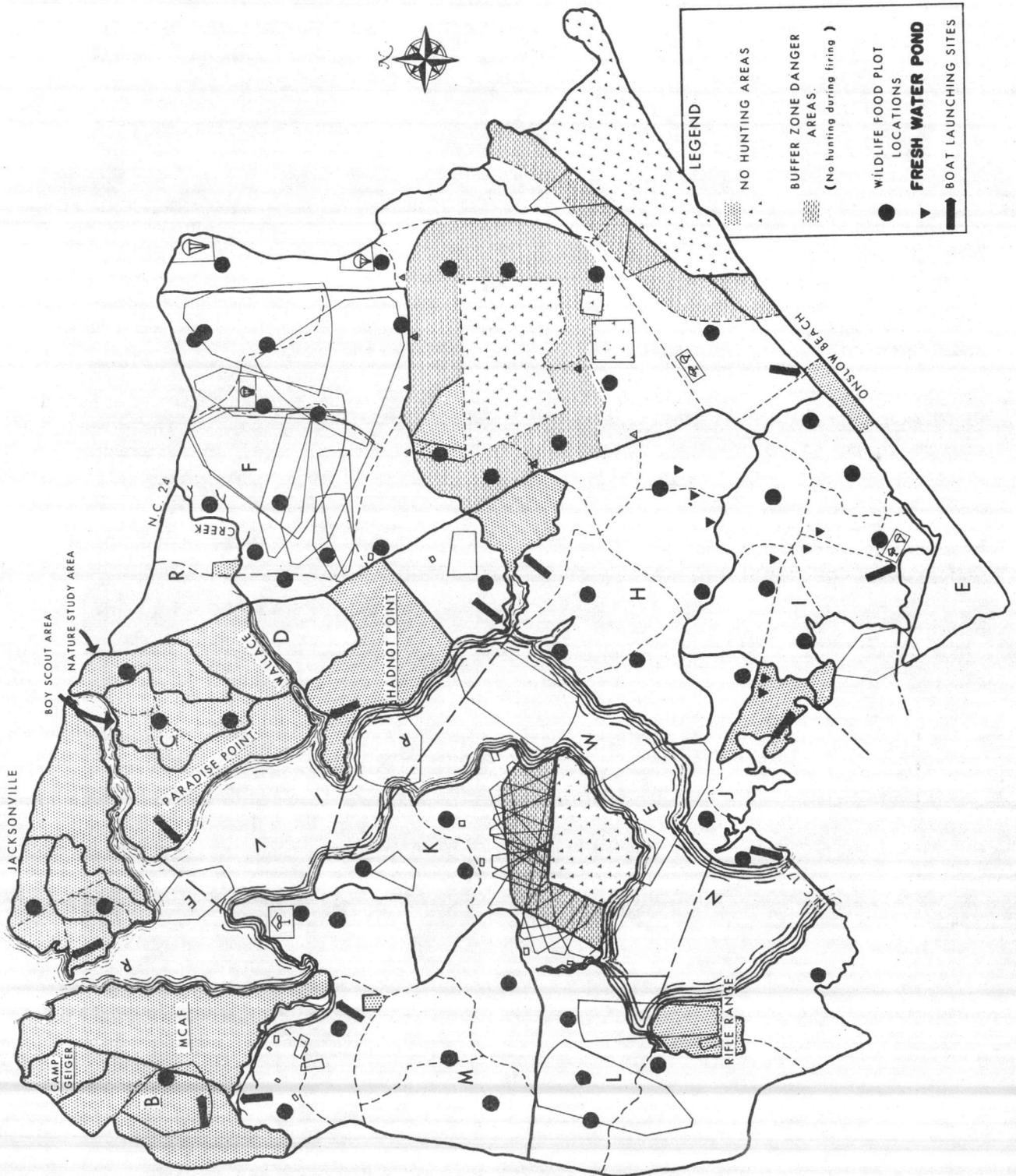
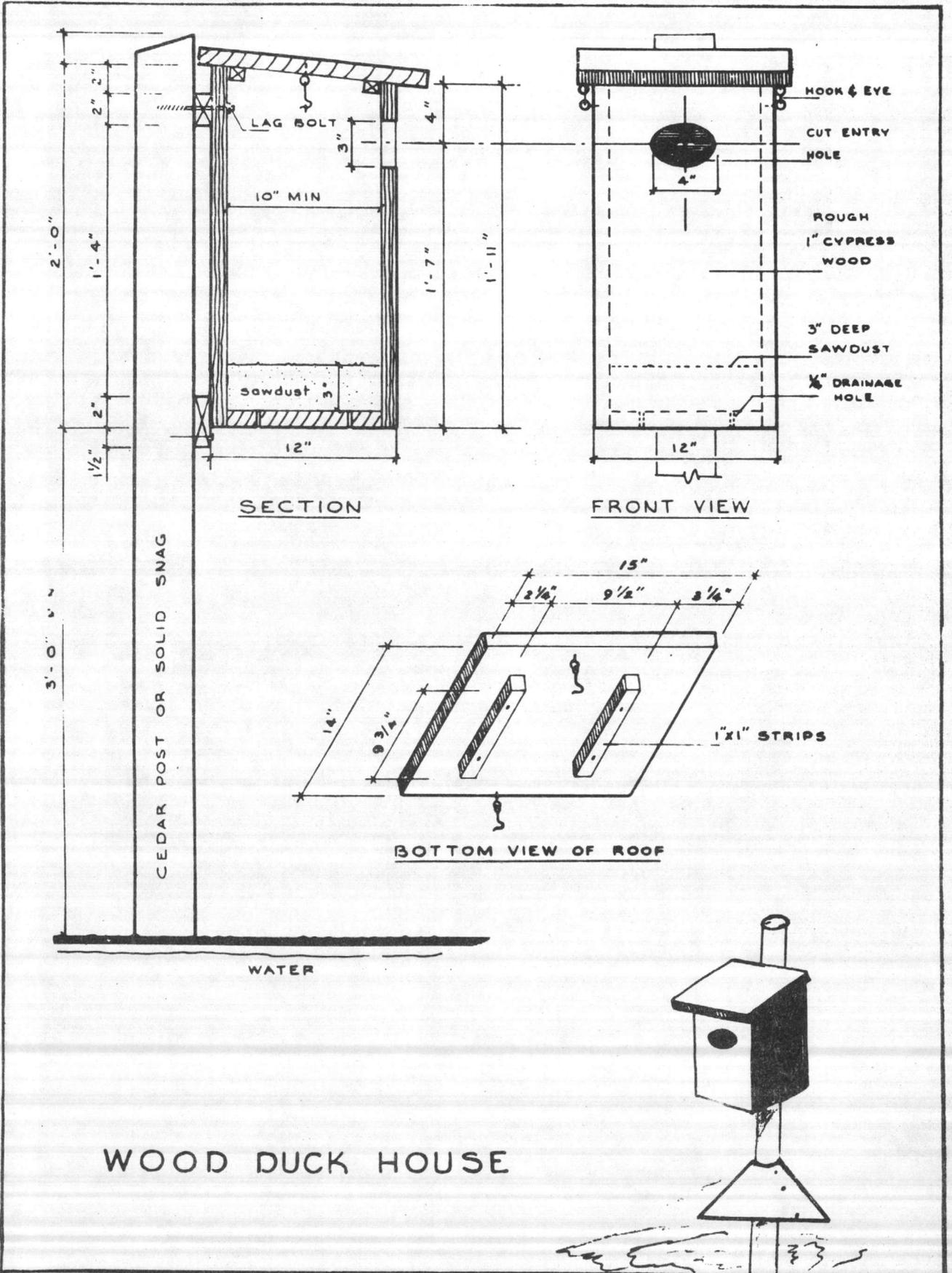




TABLE D
WOOD DUCK HOUSE PLAN



WOOD DUCK HOUSE

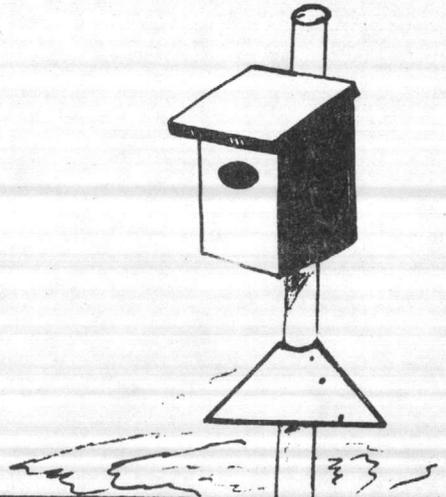




TABLE F
SUPPLEMENTAL FEEDING OF CHANNEL CATFISH

1. Basis for Supplemental Feeding. The below chart is based on 2,000 fish in a one acre pond and a food conversion of 2.0.

<u>Date of Feeding</u>	<u>No. of Fish Per Pound</u>	<u>Total Lbs of Fish</u>	<u>Pounds Food Per Day (3%)</u>	<u>Pounds Food Per Period</u>
April	12.5	159	-	-
1-15	10.4	192	5	65
16-30	8.7	231	6	78
May				
1-15	7.2	277	7	91
16-31	6.0	333	8	112
June				
1-15	5.0	398	10	130
16-30	4.2	476	12	156
July				
1-15	3.5	567	14	182
16-31	2.9	686	17	238
August				
1-15	2.4	823	21	273
16-31	2.0	998	25	350
September				
1-15	1.7	1,161	25	325
16-30	1.5	1,324	25	325
October				
1-15	1.3	1,487	25	325

2. Feeding Time

a. When surface temperature reached 60°F in the spring and until the water temperature drops below 60° in the fall.

b. 0800, six days each week.

3. Method of Feeding

a. One to three areas, approximately 400 square feet, depending upon the pond size in 3-4 feet of water.

b. Broadcast by hand the same area each time.

4. Amount

- a. Feed 3% of total weight of fish in the pond.
- b. Do not exceed 25 pounds of feed per acre per day regardless of the weight of the fish.

TABLE G
LONG RANGE WORK PLAN

1. Continued conservation of natural resources.
2. Development and maintenance of artificial wildlife habitats required to support the available natural resources.
3. Development and maintenance projects for the control of predators.
4. Development and supervision of plans for the harvesting of fish and wildlife species which will preclude over-population or extermination of any species.
5. Development and supervision of plans to ensure compliance with local, state, and federal laws and regulations pertaining to the conservation and harvesting of fish and wildlife.
6. Additional development of 16 wildlife food plots for large game and 15 plots for small game.
7. Continuance of fisheries management in eight fresh water ponds.
8. Anticipated construction of the Wallace Creek Dam for fish and waterfowl management.
9. Development of a green tree and a salt marsh impoundment for waterfowl.
10. Erection of nesting boxes for wood duck.



TABLE H
FY 68-69 WORK PLAN AND BUDGET

1. Development of five new wildlife food plots for large game and eight new plots for small game.
2. Continuing spring and fall development of the existing wildlife food plots.
3. Management of eight fresh water ponds for fishing.
4. Predator control measures during the months of January, February, and March.
5. Development of one green tree impoundment.
6. Erection of 25 nesting boxes for wood duck.
7. The FY 68-69 budget from nonappropriated funds if \$4,000.00; the estimated budget from appropriated funds if \$5,000.00.

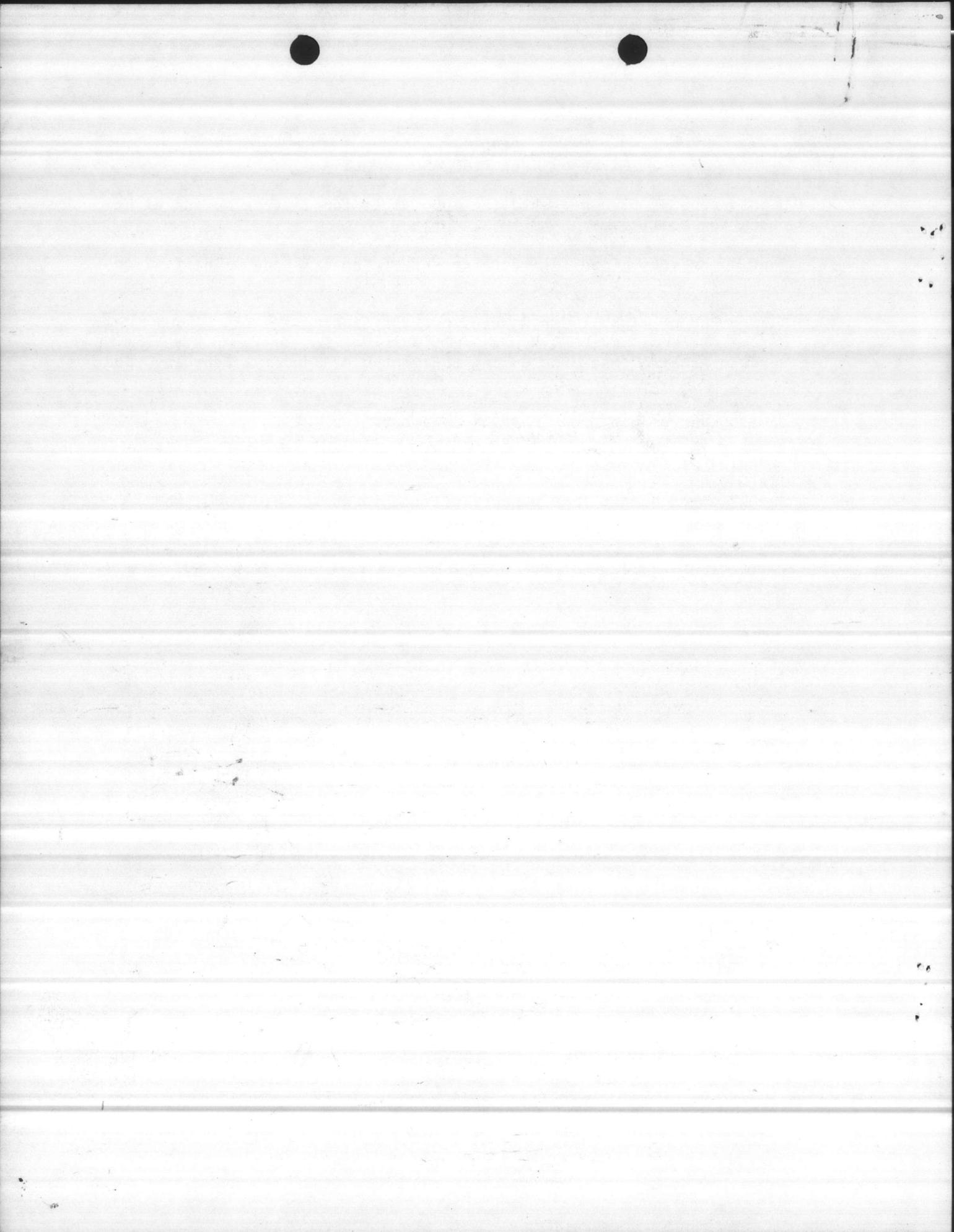


TABLE A
COOPERATIVE PLAN

1. The following agencies will be responsible for providing the Installation Commander with technical advice, assistance, and related services in fish and wildlife management:

a. Regional Director, Bureau of Sports Fisheries and Wildlife, U. S. Fish and Wildlife Service, Department of Interior, 620 Peachtree-Seventh Building, Atlanta, Georgia. (Fishery Management Program)

b. Executive Director, North Carolina Wildlife Resources Commission, Box 2919, Raleigh, North Carolina. (Wildlife Management)

(1) North Carolina Wildlife Resources Commission
Mr. Grady L. Barnes, Eastern Refuge Supervisor,
1201 Forest Drive, New Bern, North Carolina 28560

(2) North Carolina Wildlife Resources Commission
Mr. Sam Poole, Wildlife Biologist
507 Darby Avenue, Kinston, North Carolina 28501
(Small Game Management)

(3) North Carolina Wildlife Resources Commission
Mr. Thad Cherry, Wild Turkey Restoration Project Leader,
P. O. Box 683, Sanford, North Carolina 27330
(Wild Turkey Management)

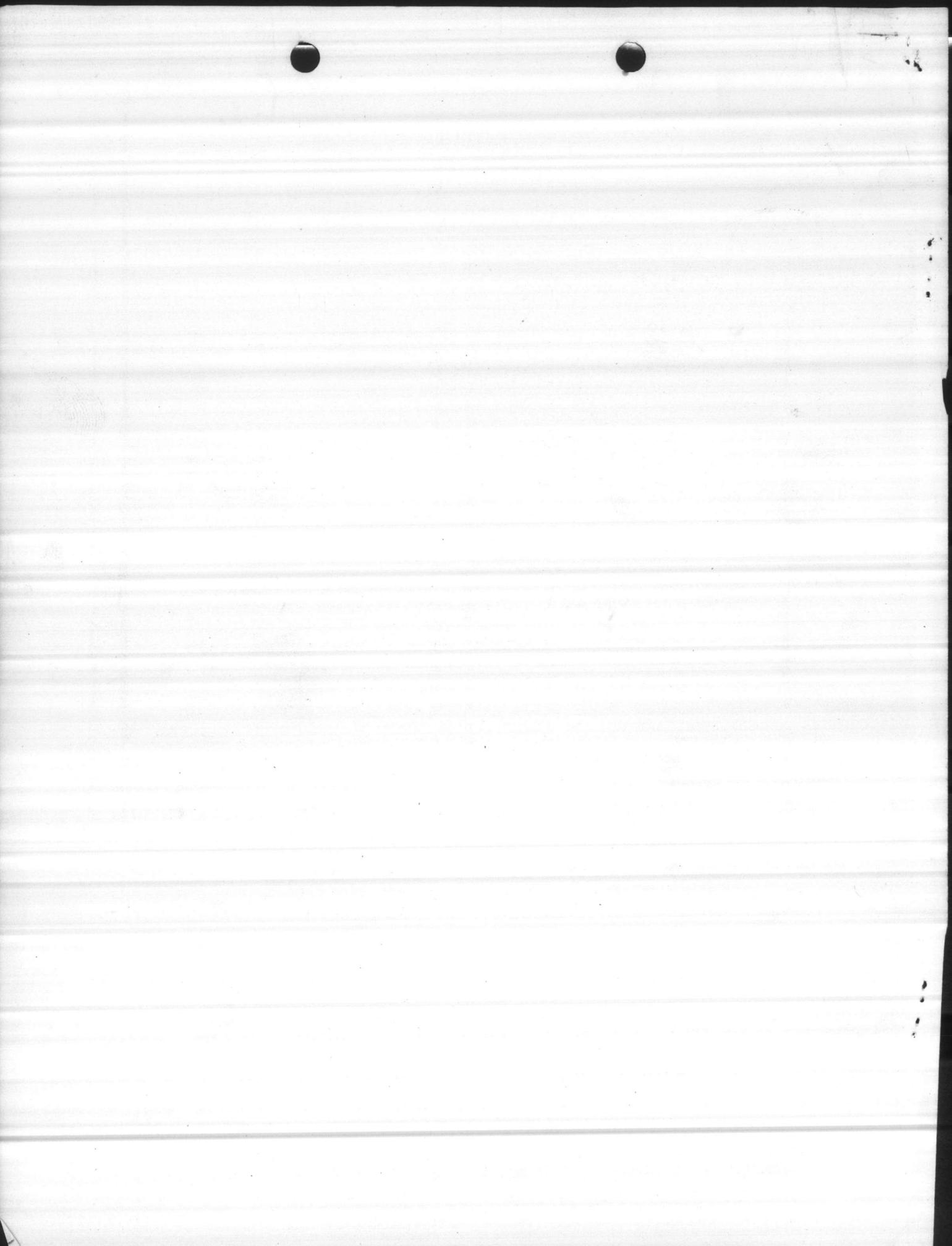
c. (4) North Carolina Wildlife Resources Commission
Mr. Paul S. Metters, Wildlife Patrolman,
Box 154, Jacksonville, North Carolina 28540
(Matters of Law Enforcement)

d. Prepare a schedule, for the following General's approval a schedule for open seasons, bag and possession limits in accordance with current Federal, State and county laws and regulations.

e. After consultation with Federal, State and county fish and wildlife authorities and other appropriate conservation agencies, make recommendations to the commanding General regarding annual harvest of fish and wildlife on the base.

f. Provide advisory services and establish procedures for scheduling and conducting frequent meetings between representatives of Federal, State and county fish and wildlife agencies and officially chartered conservation organizations. The committee will initiate and be responsive to seek out help and to work cooperatively and in harmony with the land's agencies and/or organizations. A full report of each meeting will be included in the minutes of the committee.

g. Assume, when possible, that local sportsmen groups are invited to all meetings of the committee as guests. The importance of establishing, maintaining, and improving base community relations cannot be overemphasized.



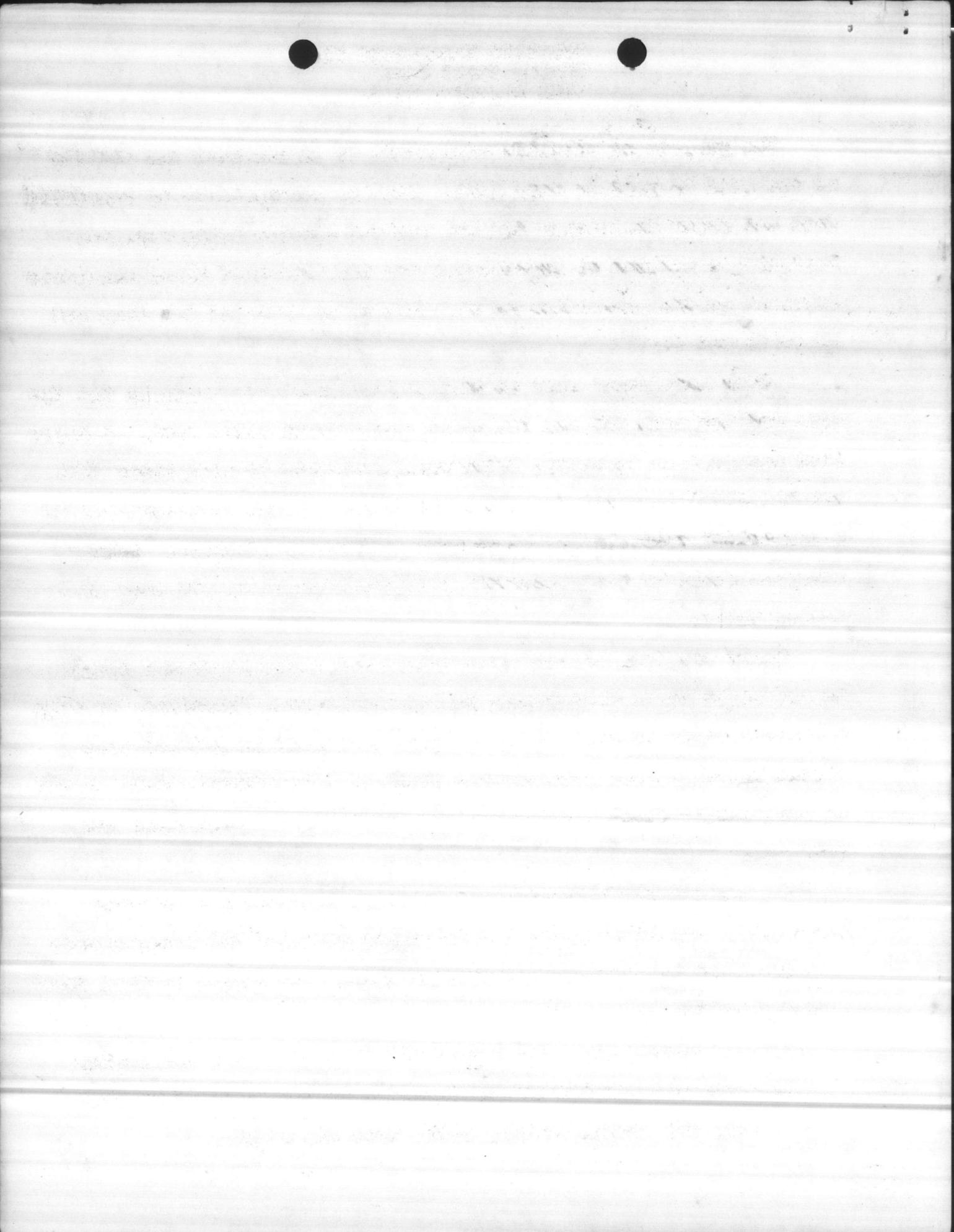
PROVOST MARSHALL'S OFFICE
MARINE CORPS BASE
GAME PROTECTOR SECTION
CAMP LEJEUNE, N. C.

10 Feb 1966

From: Base Game Protector
To: Provost Marshall
Subj: Five Year Management Plan
Encl: (1) Recommended Types of Wildlife Food Plots
(2) Management Recommendations
(3) Planting Instructions
(4) Erection of Wood Duck and Squirrel Nesting Boxes
(5) Population Inventory of Wildlife
(6) Predator Control
(7) Wildlife Protection
(8) Game Harvest

Purpose. To improve wildlife habitat and game populations to the maximum holding capacity of the entire area.

Source of Information: These management practices are based on recommendations for areas in the coastal plain section of North Carolina by the Wildlife Resources Commission and personal observations while being involved in game management and law enforcement activities.



Wildlife Management Plan
Marine Corps Base
Camp Lejeune, N. C.

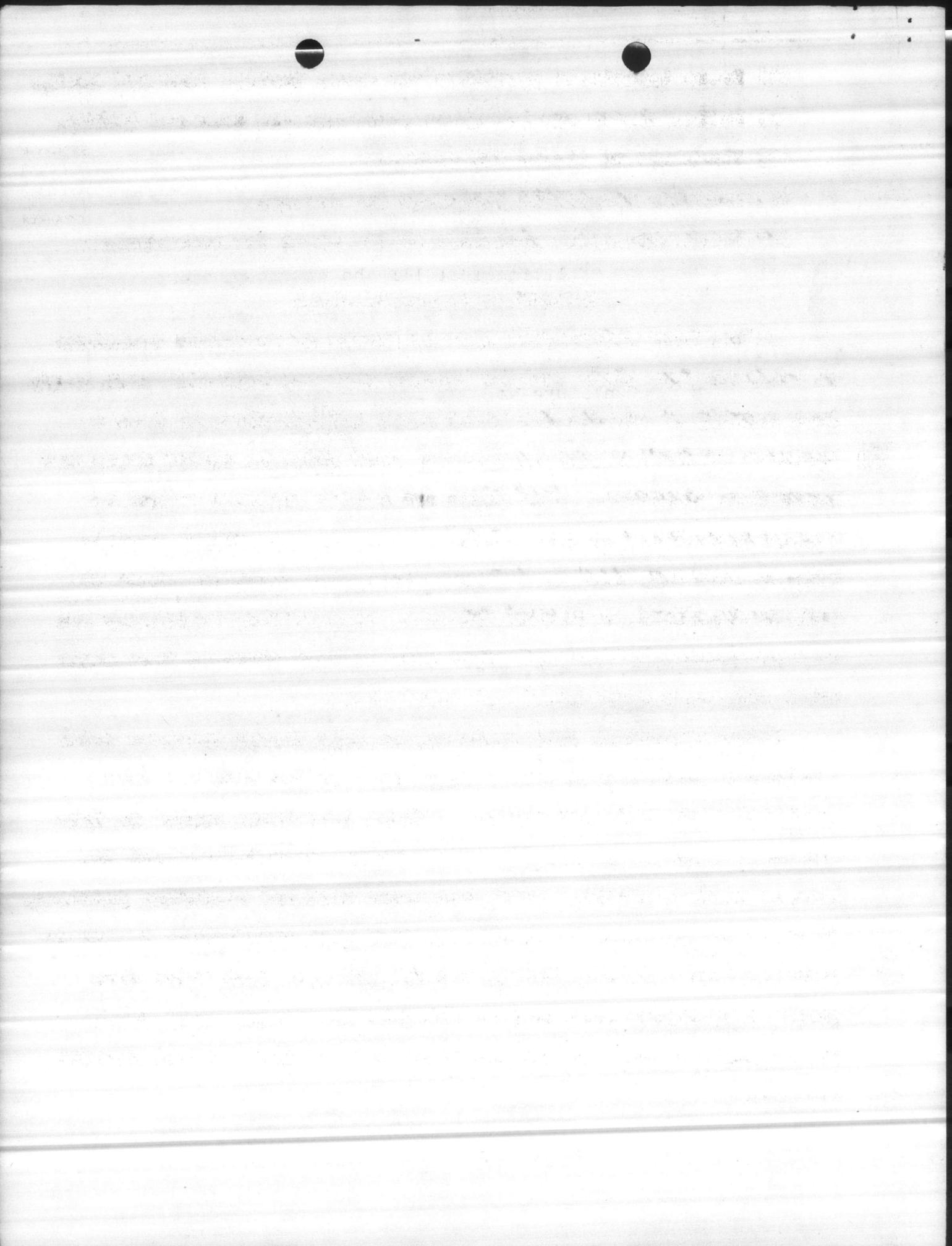
The purpose of wildlife management is to increase the ability of the land to produce more game. This is accomplished by improving food and cover conditions for the various species being managed. Producing a maximum of improvement for the amount of money available requires careful selection of the plan to be used and the time and place to use it.

Game management here at Camp Lejeune must be shaped to fit the area and the main purpose for which the area is being used. A major land use such as forestry, frequently, results in conditions that are beneficial to wildlife. At other times, slight modifications of a commercial operation could do much to benefit wildlife. Some examples would be the preservation of good den trees and mast producing trees.

There are few, if any, game management plans which are final to the point where they cannot be improved upon. Therefore, it will be necessary to exercise care and good judgement in putting into effect improvements. The effectiveness of these improvements should be continually studied and new ideas for further improvement put into use.

To improve wildlife habitat, thereby, increasing a greater harvestable supply of game, the following practices are recommended:

- (1) Shrub and sericea lespedza plantings for quail, rabbit, deer and turkey.
- (2) Rye, wheat, oats and barley plantings for deer and turkey.
- (3) Permanent mix and common lespedza plantings on light sandy soil for quail, turkey, deer, dove and rabbit.



- (4) Brown-top-millet plantings for dove, turkey, deer and quail.
- (5) Ladino clover and rye grass plantings for deer and turkey.
- (6) Plantings of chufas for turkey.
- (7) Redberry pyracantha plantings for turkey.
- (8) Brown-top-millet plantings around ponds for waterfowl.

Management Recommendations

It has been established that in tracts of woodlands creations of wildlife food plots greatly improve game populations. When there is a scarcity of agriculture lands small game populations have a tendency to decline, but by planting food plots in wooded areas the population increases. Food plots are a very definite method of supplying minerals to game species. Here in the coastal section this is very important to the deer herds, for instance, since the soil is deficient in mineral content. This mineral deficiency can be supplemented by deer and other game as they graze on food plots after they have been seeded and fertilized.

Establishment of food plots on the area should continue until one half of one percent of the total area of the base has been established as food plot sites. These food plots should be from two to six acres in size and should be dispersed throughout the base as much as possible away from areas that may encourage poaching. If it is not possible to plant each food plot every year, a plan of rotation should be effected to use all existing plot sites when possible to insure that they do not grow up. These sites supply food to some extent and nesting areas even if they are not planted each year.



All food plots should be permanently marked so that maintenance records can be recorded efficiently and to assist in directing hunters. Soil samples should be taken from each food plot and analyzed once a year.

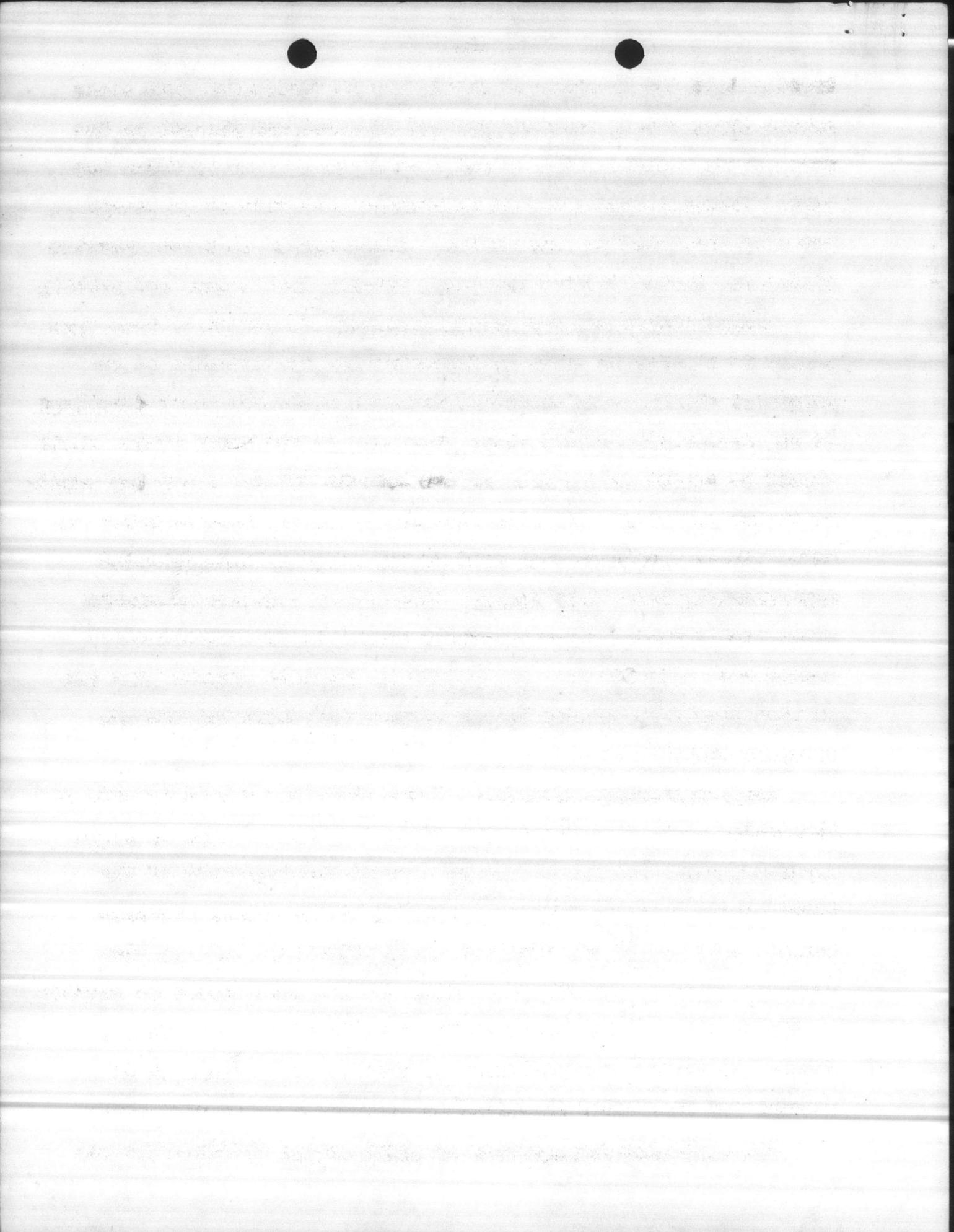
Controlled burning operations are most desirable as they enhance production of wild weed seeds that are utilized by game species. A rotation of areas in which controlled burning operations take place should be continued with each area being burned every three or four years.

Planting Instructions

Shrub and sericea lespedza and annual seed plantings: These plantings can be made in areas under powerlines, at the edge of food plots and in open wooded areas for quail primarily, but will also be utilized by deer, rabbit and turkey. Each site can be planted using two units of shrub lespedza, two units of sericea lespedza and one unit of annual seed mix. The shrub and sericea lespedza should be planted in separate plots next to each other; then, the annual seed mix can be planted either next the shrub or sericea lespedza. The shrub lespedza should be planted in early spring with the sericea lespedza and annual mix planted in late April. The annual seed mix and the shrub and sericea lespedza is obtainable from the state at no cost.

Fertilization of these plots should be 2-12-12 at the rate of 200 lbs. per acre. Maintenance consists of cutting back the shrub lespedza every four years and fertilizing.

Rye, wheat, oats and barley plantings: These grains should be planted not later than October each year. If some plantings of this type are not to be planted in the fall, common lespedza can be

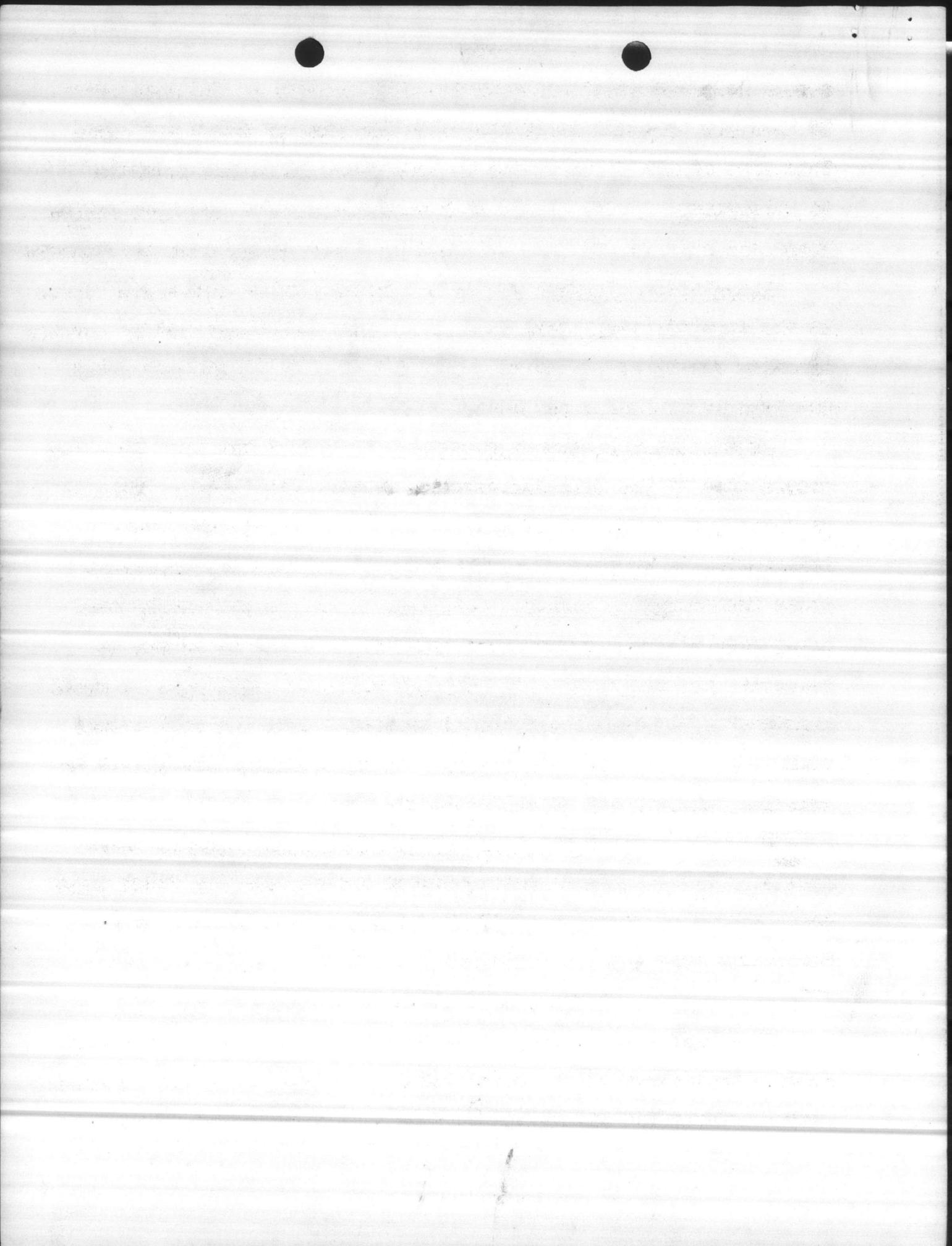


broadcast in the planting in March. It is recommended that these grains (rye, wheat, oats and barley) be mixed and planted at the rate of two bushels per acre and fertilized 400 lbs of 6-8-6 per acre. Common lespedza should be broadcast at rate of 30 pounds per acre when used on these sites. Plantings of this type provide winter and spring feeding for deer, turkey, quail, dove and rabbit.

Ladino clover and rye grass plantings: Plantings of this type should be planted in April or September and are established as permanent sites. When selecting proposed plots for these plantings it is necessary to select plots that have fairly heavy soils. Plots should be seeded at the rate of two bushels rye grass and two pounds of clover per acre. Fertilization should be 500 lbs. of 6-8-6 per acre. These plantings will need to be disced up and re-seeded approximately every four years. Maintenance consists of mowing twice each summer. These plantings should be top-dressed every second year with 500 lbs. of 2-12-12 in the late summer. One ton of lime should be applied before planting if there has been no previous application.

Brown-top-millet plantings: These plantings should be made in June which will allow the seed a minimum amount of time to begin drying up for a maximum of use by dove at the beginning of the first season on dove, thereby, insuring better hunter success. These plantings are for dove and quail primarily, but are also utilized by deer, turkey and rabbit. Millet seed should be planted at the rate of 35 lbs. per acre and fertilized with 500 lbs. of 6-8-6. To better improve hunter success on dove hunts, it is recommended that these plantings be cultivated twice each year.

Permanent Mix and lespedza on light soils: Millet, milo and



common lespedza mixed and sown in equal amounts at the rate of 30 lbs. per acre and fertilized with 500 lbs. of 6-8-6 per acre. This type annual planting can be made where it is not possible to make other type plantings with much success due to light soils. Plantings of this type are utilized by quail, dove, deer and turkey.

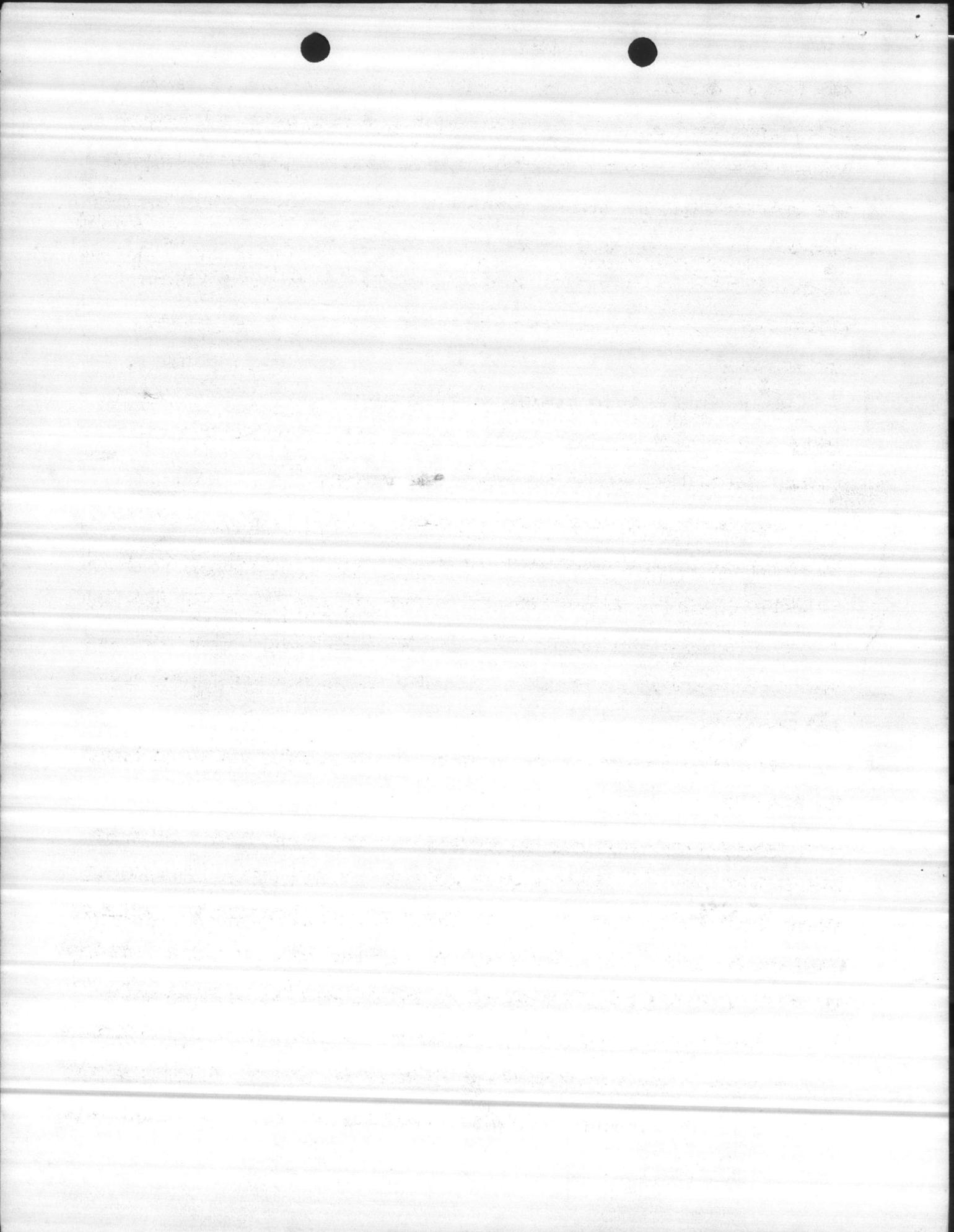
Plantings of chufas: Chufas can be planted in one-eighth plots at the edge of established food plots that are frequented by turkey. Planting should be at the rate of 400 lbs of 6-8-6 per acre, and two bushels of chufas per acre.

Pyracantha (firethorn) plantings: This is a new type planting recommended by the Soil Conservation Service for turkey. This is an ornamental shrub and is planted from seedling stock and is recommended to be planted at the edge of existing food plots in areas frequented by turkey. Seedlings should be planted by hand using care in packing the loose soil around roots so as not to leave air pockets which might dry out roots of seedlings. A small amount of 6-8-6 fertilizer should be worked into the soil around seedlings at the time of planting. After seedlings are placed in position, they should be well watered.

Brown-top-millet plantings around fresh water ponds: These plantings can be made in narrow strips around existing fresh water ponds seeded at the rate of 35 lbs of millet and 500 lbs of 6-8-6 fertilizer per acre for waterfowl.

Purpose of these type plantings

When native plants do not produce food due to drought, frost disease, plantings of permanent and annual food plots are especially useful. Permanent plantings are used for green grazing throughout



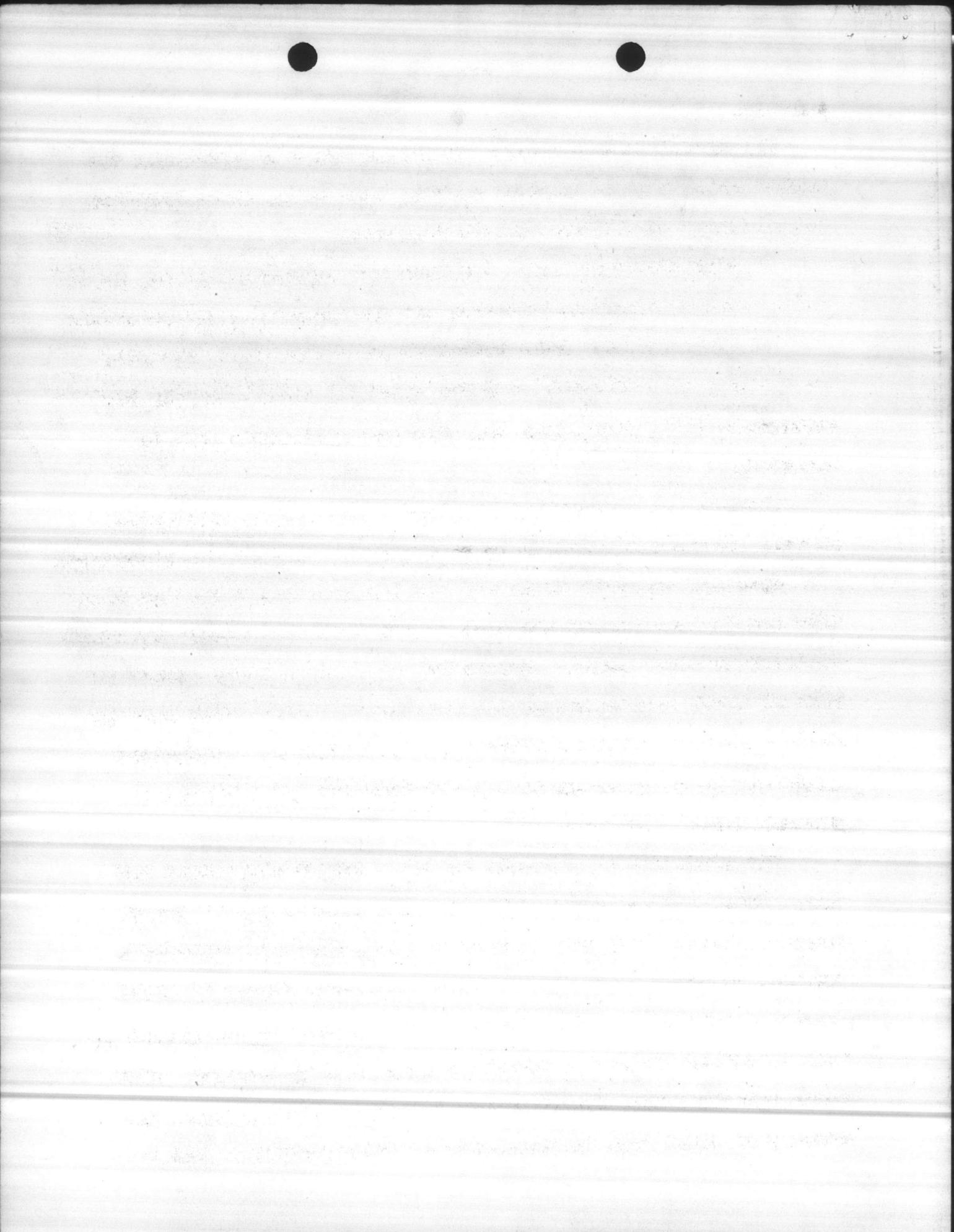
the year. Annual plantings supply food in the form of seed, tubers and graze. Annuals such as rye, wheat, oats and barley supply food in winter and early spring when permanent plantings are not available. Annual plantings such as millet and lespedza planted in the spring provide seeds and tubers for fall and winter use and a source of insect food in the summer. These plantings also provide cover for quail nesting sites during the summer.

Shrub lespedza plantings furnish green grazing for deer in early spring and provide an abundant supply of seeds in late winter and early spring for quail and turkey.

Erection of wood duck and squirrel nesting boxes: Presently there are many wood duck nesting boxes that have been erected at various locations on the base. The Rod and Gun Club and the Boy Scouts are continuing this valuable management practice. All the wood duck nesting boxes that have been inspected have been used for nesting.

It would be desirable to also erect squirrel nesting boxes to increase productivity of this species.

Population inventory of wildlife: It is important to know the populations of various game species so that sound management plans can be followed here. No inventory of game can be entirely correct on a area, but the count of various species can be arrived at with some degree of accuracy by making careful observations. These observations are of three general types: direct observations of the animal itself, sign which applies to tracks, droppings and other physical evidence of animal activity and calls of birds and



animals.

(1) Direct observations: In making these observations the number seen, type of bird or animal, sex, date, time, location and weather conditions will be recorded.

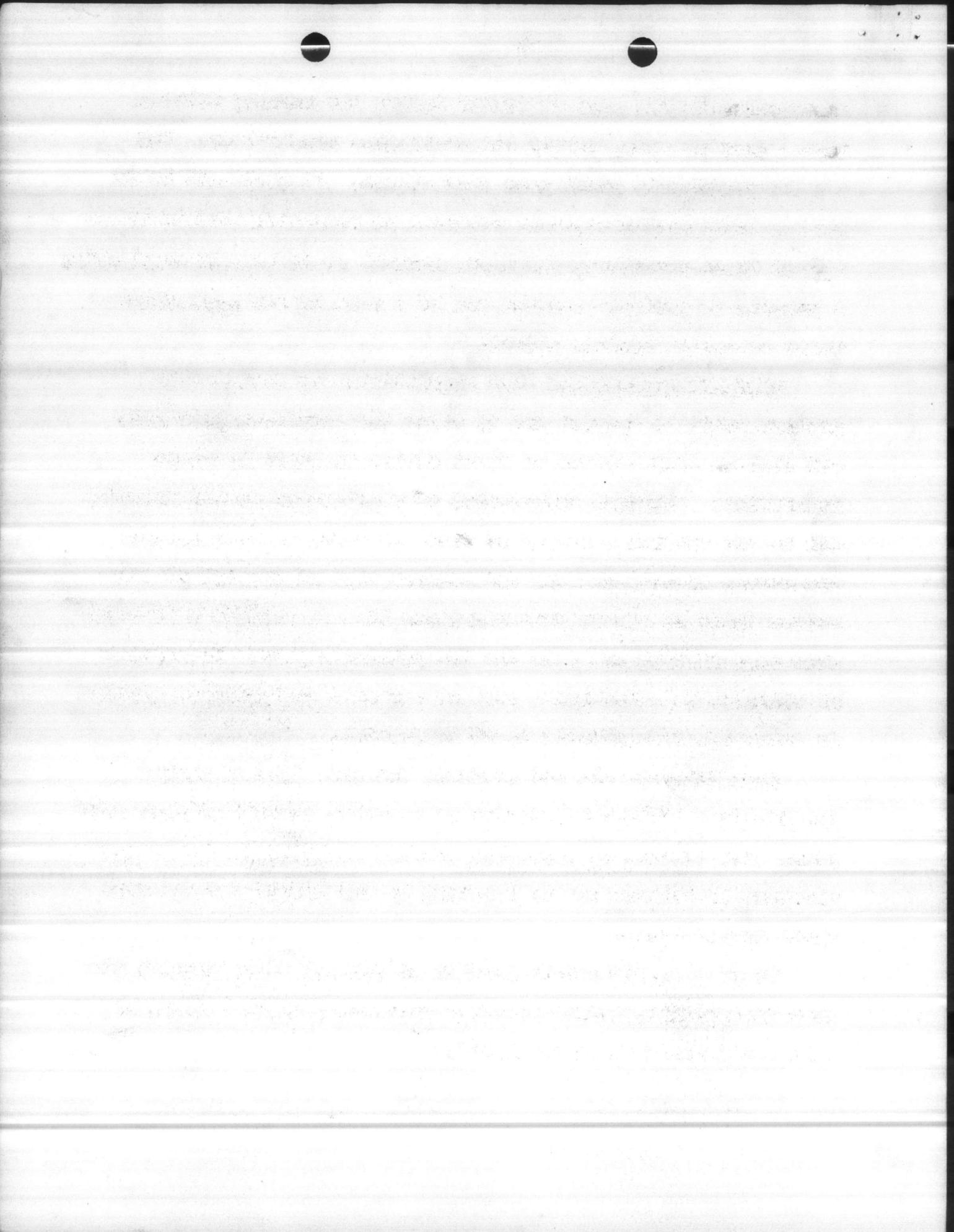
(2) Sign observations: The kind and number of tracks, nests, beds, antler rubbings, browsing and droppings will be recorded.

(3) Call counts: This method is used throughout the year as a method of inventory of game. Types of animals making the particular call, date, area and weather conditions will be recorded.

These three methods will be used while we are on routine patrols throughout the base in making annual population inventory.

Predator control: Predation has its greatest effect on wildlife populations during the nesting and dropping season and while wildlife is still small. Presently, there is a heavy amount of sign of skunk and bobcat on the area of the base. With this in mind, a planned trapping program can be initiated immediately after the hunting season is over in February and continuing through March each year.

The predators that should be taken are skunk, bobcat and fox. Careful observation will be taken to insure that these named predators will not be over-trapped, thereby, insuring a balance as much as possible. These predators should be taken over the entire area of the base. This segment of management is very important to game populations here at Camp Lejeune. With much emphasis being placed on the turkey at present time, the trapping of skunk will be necessary as these predators are very



destructive to the eggs of turkey during the nesting season. Bobcat prey on deer, turkey and small game populations. Fox are destructive to small game populations. It would not be in keeping with good management practices to completely eradicate any of these predators, but their control would be most desirable. A program of predator control can be a part of our operations while we are on routine patrol.

Wildlife Protection: Base regulations are designed to protect wildlife species and to offer the sportsmen that hunt and fish on Camp Lejeune an equal chance to share in these activities. Although enforcement of regulations do not actually add to the available supply of fish and game, it does protect the supply already on hand and insures that at the end of the season there is enough breeding stock left to produce a harvestable crop of fish and game for the following year. Protection of wildlife is a necessary part of any good conservation program in order for that program to be successful.

Game Harvest: The end product, the goal that is worked towards in a management program is a better harvest of game each year. The harvest is important because it helps keep game populations in balance and is a return to the hunter for his time spent in the field.

To improve the annual harvest of game at Camp Lejeune, we must apply sound, modern practices and continually be familiar with our current management needs.



1
2
3

ANNUAL SEED MIXTURE FORMULAE

Per Acre

12 lbs. Brown-top-millet

12 lbs. Common lespedeza

6 lbs. Milo

30 lbs.

These annual seed planted together on food plots for small game.

ANNUAL SEED MIXTURE FORMULA

Per Acre

10 lbs. Brown-top Millet
15 lbs. Common Lambseed
6 lbs. Wild
30 lbs.

These annual seed planted together on food

plots for small game.

WILDLIFE MANAGEMENT PLAN
MARINE CORPS BASE
CAMP LEJEUNE, N.C.

The objective of this game management plan is to manage the present lands in such a manner as to provide optimum conditions for game and the hunting public, and to assure continued production and use of these valuable game resources.

In order to develop favorable wildlife habitat and increase game populations on the area, the following game management practices are recommended:

1. Shrub lespedeza-sericea-annual seed plantings for quail, rabbits, deer, and turkey.
2. Ladino clover-rye grass for deer and turkey.
3. Wheat, oats, rye, and barley for deer and turkey.
4. The establishment of permanent mix and common lespedeza on light sandy soils for deer, turkey, doves, quail, and rabbits.
5. Brown top millet plantings for doves, deer, quail, and turkey. This will be in the annual mix or could be substituted for some of the other small grains in the fall plantings. (This should be in early fall.)

Management Recommendations

The existing and proposed game management improvements have been numbered on the attached game plan map. A composite list is also attached giving soil types, status of fields, probable game utilization of plantings and fields, and supplemental planting materials to be used to increase the game species and maintain a harvestable surplus of game.

For each food plot soil samples could be taken, ^{when} ~~if it is~~ deemed necessary, in the future to insure exact soil types and materials adaptable to these sites. Little clearing of chosen sites will be necessary. Half of the food plot fields are all cleared and have been in cultivation for some time. It is recommended that three or four additional plots be cleared each spring. The size of these fields are from 4-6 acres and do not appear to be too large, since an ideal figure is 1% to 2% of the entire base acreage, for maximum game development, and since our plan proposes to attain only 1/2 of 1%, it is not deemed necessary to reduce the acreage of the proposed and existing fields. It would, however, be advisable to put as much and as many of these fields into permanent pasture as possible. Soil type is the limiting factor.

Woodlands

In order to maintain optimum conditions for game ~~on the base~~ a system of controlled burning and/or disking would be desirable. Some open woods would be highly desirable, not only for convenient hunting accessibility, use

WILDLIFE MANAGEMENT PLAN
MADRID CORP. WBE
CAMP LITTLE, T.C.

The objective of this management plan is to manage the present lands in such a manner as to provide optimum conditions for game and the hunting public, and to assure continued production and use of these valuable game resources.

In order to develop favorable wildlife habitat and increase the populations of the area, the following game management practices are recommended:

1. Annual lespedeza-seedling seed plantings for quail, quail, quail, and quail.
2. Planting clover-type grass for deer and turkey.
3. Planting alfalfa, and barley for deer and turkey.
4. The establishment of permanent timber and common lespedeza on the early soils for deer, quail, quail, quail, and quail.
5. Brown top soil plantings for quail, quail, quail, and quail. This will be in the amount of one acre for each 100 acres of the area. The plantings should be in the early fall.

Management Recommendations

The existing and proposed game management practices have been numbered on the attached game plan map. A complete list of these practices, types of fields, and supplemental planting materials to be used to increase the game areas and maintain a harvestable surplus of game.

For each food plot soil samples should be taken, and the results necessary, in the future to measure soil types and to determine the type of soil to be used. Little clearing of brush areas will be necessary. This is to be done in the fall and the results of the soil analysis to be reported. It is recommended that three or four additional plots be cleared each spring. The size of these fields are from 1/2 to 1 acre and should appear to be too large, since the total figure is 10 to 20 acres. These areas, for maximum game development, and since our plan proposes to establish only 1/2 of 1%, it is not deemed necessary to reduce the size of the proposed and existing fields. However, be advised that the amount and type of these fields and permanent pasture is possible. Soil types are the following factor.

Woodlands

In order to maintain a good quality woodlands for game and to ensure of continued hunting and to provide for the best possible game and woodlands, the following management practices are recommended:

of dogs and clear shooting, but also because they offer one of the more favorable small game habitats. Burning or disking encourages legumes, such as partridge pea, desmodium, and other highly desirable weed seeds, and greens that are a choice food of quail and other small game. A rotation system should be worked out in these areas whereby the areas could be burned every third or fourth year. This would maintain the open areas at a desirable beginning plant succession and would provide the most desirable small game hunting conditions, as well as providing additional browse and greens for this important deer herd. These areas planted for game should not be burned.

New Field Development

Three or four new fields should be created each spring until the optimum number of 4-6 acre fields reaches a total of 63. These fields should be pushed, burned, or disked, and prepared like a seed bed. The annuals planted in the spring would help prepare the soil for fall and winter plantings adding nitrogen to the new soil, and making them more tenable.

Small Game Management

The management for small game includes the establishment of supplemental food and cover through the planting of shrub lespedeza, sericea, and annual seed plantings for quail, doves, turkey, deer, and other small game. Other recommended plantings for deer, turkey, and doves also apply to small game. Note should be taken here, that after much discussion and volunteered information, peas and beans and soybeans do not seem worthwhile in an annual mixture due to the fact that deer clip the first growth from the cotyledon and consequently the pea, bean, or soybeans do not have a chance to produce stalk growth or seed. It is recommended that the peas, beans, and soybeans be left out of the annual mix.

Shrub lespedeza recommended and indicated on the supplemental game foods planting list should be of the VA-70 variety, due to the fact that it is less likely to be taken by deer before it becomes established.

Instructions for Planting

Shrub lespedeza-sericea-annual seed plantings: These plantings are composed of 2 units of shrub lespedeza, 2 units of sericea, and 1 unit of annual seed. These should plant an area 1/2 an acre in size. The area to be planted should be disked and fertilized at the rate of 200 lbs. per acre with 2-12-12, broadcast seeded and dragged in. The recommended annual mixture should be planted in the spring on all fields. Borders of the winter plantings should be left standing of approximately 1/2 acre to serve as food, as well as for loafing, nesting, roosting, and escape cover, during the period of transition from the fall plantings to the spring plantings. All small game plantings and permanent clover plantings should

be left undisturbed. The shrub-sericea plots should, however, be cut back and fertilized every 3 or 4 years. Clover plantings, will in all possibility, have to be reseeded and fertilized every 3 or 4 years. The clover plantings can be given some longevity by top dressing in the fall in addition to the original fertilization at the time of planting.

Ladino clover-rye: Areas recommended for ladino clover plantings should be plowed and disked in preparation for planting. Fields should be fertilized at the rate of 400-600 lbs. of 6-8-6 per acre. Seeding should be made at the rate of 6 lbs. of Ladino and 3/4 of a bushel of rye per acre. Ladino seed should be inoculated.

Brown-top millet: Areas recommended to brown top millet should be planted the first of July. Seeding should be made at the rate of 35 lbs. per acre on a well prepared seed bed and fertilized with 400-600 lbs. of 6-8-6 per acre.

Wheat, oats, rye and barley: The area to be planted to wheat, oats, rye, and barley for turkey and deer should be plowed, disked, and broadcast. Fields should be fertilized at the rate of 400 lbs. per acre of 6-8-6.

Common lespedeza: Common lespedeza (spring) same as annuals.

Respectfully submitted:

Sam F. Poole,
District 2 Biologist.

the left and right. The three services please should, however, be out of
and fertilized every 2 or 3 years. Clive plants, will in all probability
have no bareheaded and fertilized every 3 or 4 years. The other
plants can be given some low cost by top dressing in the fall in
addition to the regular fertilization at the time of planting.

Limbo flower: Areas recommended for limbo clover plantings
should be planted and a good preparation for planting. Fertilizer should be
fertilized at the rate of 100-100 lbs. of 10-10-10 per acre. Seeding
should be done at the rate of 5 lbs. of limbo and 2 1/2 of a bushel of
the other. Limbo seed should be broadcast.

Low-top millet: Areas recommended for low-top millet should be
planted the first of July. Seeding should be made at the rate of 25 lbs.
per acre and well prepared seed bed and fertilized with 100-100 lbs. of
10-10-10.

Wheat, oats, rye and barley: The areas to be planted to wheat, oats,
rye, and barley should be well prepared and fertilized with 100 lbs. per acre of
10-10-10. Fertilizer should be broadcast at the rate of 100 lbs. per acre of
10-10-10.

Common Legumes: Common legumes (beans) and as annuals.

Responsible, and listed:

Dr. F. Boole,
District Biologist.

SOIL TYPE	STATUS OF FIELD	GAME UTILIZATION OF FIELDS	SUPPLEMENTAL PLOTS FOR ALL GAME SPECIES	SUPPLEMENTAL PLOTS FOR SMALL GAME
1. Sandy loam	powerline	deer, quail	2a.rye, loats, 1clover	
2. Sandy loam	1 block cleared	deer, quail, turkey	2a.rye, 1 $\frac{1}{2}$ wheat, "	shrub, S.S.*
3. Sandy yellow subsoil		deer, quail, dove	2a.rye, 2 comm. lesp.	shrub, S.S.
4. Silt loam	cleared	deer, quail, dove	1a.rye, 2barley, 2clover	shrub, S.S.
5. Sandy loam	partly cleared	quail, doves	1a.clov., 1/8 P.mix., 3 comm. lesp.	
6. Heavy to sandy loam		deer, quail, dove	3a.rye, 1 clover	
7. Sandy loam to light sand		deer, quail, dove	2a.rye, 2oats, 1wheat	shrub, S.S.*
8. Sandy	uncleared	deer, turkey, quail, dove	1rye, 1barley, 1wheat, 1 comm. lesp.	
● Sand-deep	firing range	deer, quail	1rye, loats, 1barley, 1 comm. lesp.	
10. Heavy black soil	uncleared	deer, quail, dove	2rye, 2clover, 1wheat	shrub, S.S.*
11. Light sand & wet black sand	4a.cleared	deer, quail, dove, turkey	1rye, 1barley, 1wheat, 1a.clover, loats, 3rye	shrub, S.S.
12. Light sand, 1/4a.black soil		deer, quail, dove, turkey	2rye, 1wheat, loats	shrub, S.S.*
13. Light sand		deer, quail, dove, turkey	2rye, 1wheat, 1barley	
14. Light sand		deer, quail, dove, turkey	1rye, 1wheat, 4clover	
15. Loam clay sub soil	uncleared	deer, quail, dove, turkey	4A.rye	shrub, S.S.*
16. Light sand, yellow sub soil		dove, quail, deer, turkey	4a.rye	shrub, S.S.*
17. Sandy loam	tobacco land	deer, quail, dove, turkey	2a.rye, 2barley	shrub, S.S.
18. Loam clay		deer, quail, dove, turkey	4a.rye	shrub, S.S.
19. Light sand		deer, quail, dove, turkey	4A.rye	
20. Light sand (pest) yellow sub soil		deer, quail, dove, turkey	4a.rye	
21. Light sandy soil		deer, quail, dove	2a.rye, 2wheat	
● Deep sand, black sub-soil		deer, quail, dove, turkey	4a.rye	shrub, S.S.
23. Coastal sand, oyster shells black sub-soil		deer, quail, dove, turkey	4a.rye	
24. Same as above		deer, quail, dove, turkey	2rye, 2oats	shrub, S.S.
25. Sandy wet springy	pushed, notcut	deer, quail, dove, turkey	2a.clover, 2rye	shrub, S.S.
26, 27, 28, 29 same as 22			1a.clover, 3rye	shrub, S.S.
30. Black sand	uncleared	deer, quail, dove	2a.rye, 2clover	shrub, S.S.
31. Light sand yellow sub-soil wet corner		deer, quail, dove	2a.rye, 2clover	shrub, S.S.*
32. Clay loam, good land		deer, quail, dove, turkey	2a.rye, 2clover	
33. Clay, clay not as heavy		deer, quail, dove, turkey		
34 and 35 same as 26.				
36. Bay		deer, quail, dove, turkey	2a.rye, loats, 1barley	shrub, S.S.
37. Sandy sound land		deer, quail, dove, turkey	4a.rye	shrub, S.S.
38. Sandy loam	1a.clover	deer, quail, dove, turkey	1rye, 1wheat, loats, 1clouv.	shrub, S.S.

DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	BALANCE
1/1/52	Balance	100.00			100.00
1/15/52	John Doe	50.00	101		50.00
2/1/52	John Doe	50.00	102		0.00
2/15/52	John Doe	50.00	103		50.00
3/1/52	John Doe	50.00	104		0.00
3/15/52	John Doe	50.00	105		50.00
4/1/52	John Doe	50.00	106		0.00
4/15/52	John Doe	50.00	107		50.00
5/1/52	John Doe	50.00	108		0.00
5/15/52	John Doe	50.00	109		50.00
6/1/52	John Doe	50.00	110		0.00
6/15/52	John Doe	50.00	111		50.00
7/1/52	John Doe	50.00	112		0.00
7/15/52	John Doe	50.00	113		50.00
8/1/52	John Doe	50.00	114		0.00
8/15/52	John Doe	50.00	115		50.00
9/1/52	John Doe	50.00	116		0.00
9/15/52	John Doe	50.00	117		50.00
10/1/52	John Doe	50.00	118		0.00
10/15/52	John Doe	50.00	119		50.00
11/1/52	John Doe	50.00	120		0.00
11/15/52	John Doe	50.00	121		50.00
12/1/52	John Doe	50.00	122		0.00
12/15/52	John Doe	50.00	123		50.00
1/1/53	John Doe	50.00	124		0.00
1/15/53	John Doe	50.00	125		50.00
2/1/53	John Doe	50.00	126		0.00
2/15/53	John Doe	50.00	127		50.00
3/1/53	John Doe	50.00	128		0.00
3/15/53	John Doe	50.00	129		50.00
4/1/53	John Doe	50.00	130		0.00
4/15/53	John Doe	50.00	131		50.00
5/1/53	John Doe	50.00	132		0.00
5/15/53	John Doe	50.00	133		50.00
6/1/53	John Doe	50.00	134		0.00
6/15/53	John Doe	50.00	135		50.00
7/1/53	John Doe	50.00	136		0.00
7/15/53	John Doe	50.00	137		50.00
8/1/53	John Doe	50.00	138		0.00
8/15/53	John Doe	50.00	139		50.00
9/1/53	John Doe	50.00	140		0.00
9/15/53	John Doe	50.00	141		50.00
10/1/53	John Doe	50.00	142		0.00
10/15/53	John Doe	50.00	143		50.00
11/1/53	John Doe	50.00	144		0.00
11/15/53	John Doe	50.00	145		50.00
12/1/53	John Doe	50.00	146		0.00
12/15/53	John Doe	50.00	147		50.00
1/1/54	John Doe	50.00	148		0.00
1/15/54	John Doe	50.00	149		50.00
2/1/54	John Doe	50.00	150		0.00
2/15/54	John Doe	50.00	151		50.00
3/1/54	John Doe	50.00	152		0.00
3/15/54	John Doe	50.00	153		50.00
4/1/54	John Doe	50.00	154		0.00
4/15/54	John Doe	50.00	155		50.00
5/1/54	John Doe	50.00	156		0.00
5/15/54	John Doe	50.00	157		50.00
6/1/54	John Doe	50.00	158		0.00
6/15/54	John Doe	50.00	159		50.00
7/1/54	John Doe	50.00	160		0.00
7/15/54	John Doe	50.00	161		50.00
8/1/54	John Doe	50.00	162		0.00
8/15/54	John Doe	50.00	163		50.00
9/1/54	John Doe	50.00	164		0.00
9/15/54	John Doe	50.00	165		50.00
10/1/54	John Doe	50.00	166		0.00
10/15/54	John Doe	50.00	167		50.00
11/1/54	John Doe	50.00	168		0.00
11/15/54	John Doe	50.00	169		50.00
12/1/54	John Doe	50.00	170		0.00
12/15/54	John Doe	50.00	171		50.00
1/1/55	John Doe	50.00	172		0.00
1/15/55	John Doe	50.00	173		50.00
2/1/55	John Doe	50.00	174		0.00
2/15/55	John Doe	50.00	175		50.00
3/1/55	John Doe	50.00	176		0.00
3/15/55	John Doe	50.00	177		50.00
4/1/55	John Doe	50.00	178		0.00
4/15/55	John Doe	50.00	179		50.00
5/1/55	John Doe	50.00	180		0.00
5/15/55	John Doe	50.00	181		50.00
6/1/55	John Doe	50.00	182		0.00
6/15/55	John Doe	50.00	183		50.00
7/1/55	John Doe	50.00	184		0.00
7/15/55	John Doe	50.00	185		50.00
8/1/55	John Doe	50.00	186		0.00
8/15/55	John Doe	50.00	187		50.00
9/1/55	John Doe	50.00	188		0.00
9/15/55	John Doe	50.00	189		50.00
10/1/55	John Doe	50.00	190		0.00
10/15/55	John Doe	50.00	191		50.00
11/1/55	John Doe	50.00	192		0.00
11/15/55	John Doe	50.00	193		50.00
12/1/55	John Doe	50.00	194		0.00
12/15/55	John Doe	50.00	195		50.00
1/1/56	John Doe	50.00	196		0.00
1/15/56	John Doe	50.00	197		50.00
2/1/56	John Doe	50.00	198		0.00
2/15/56	John Doe	50.00	199		50.00
3/1/56	John Doe	50.00	200		0.00
3/15/56	John Doe	50.00	201		50.00
4/1/56	John Doe	50.00	202		0.00
4/15/56	John Doe	50.00	203		50.00
5/1/56	John Doe	50.00	204		0.00
5/15/56	John Doe	50.00	205		50.00
6/1/56	John Doe	50.00	206		0.00
6/15/56	John Doe	50.00	207		50.00
7/1/56	John Doe	50.00	208		0.00
7/15/56	John Doe	50.00	209		50.00
8/1/56	John Doe	50.00	210		0.00
8/15/56	John Doe	50.00	211		50.00
9/1/56	John Doe	50.00	212		0.00
9/15/56	John Doe	50.00	213		50.00
10/1/56	John Doe	50.00	214		0.00
10/15/56	John Doe	50.00	215		50.00
11/1/56	John Doe	50.00	216		0.00
11/15/56	John Doe	50.00	217		50.00
12/1/56	John Doe	50.00	218		0.00
12/15/56	John Doe	50.00	219		50.00
1/1/57	John Doe	50.00	220		0.00
1/15/57	John Doe	50.00	221		50.00
2/1/57	John Doe	50.00	222		0.00
2/15/57	John Doe	50.00	223		50.00
3/1/57	John Doe	50.00	224		0.00
3/15/57	John Doe	50.00	225		50.00
4/1/57	John Doe	50.00	226		0.00
4/15/57	John Doe	50.00	227		50.00
5/1/57	John Doe	50.00	228		0.00
5/15/57	John Doe	50.00	229		50.00
6/1/57	John Doe	50.00	230		0.00
6/15/57	John Doe	50.00	231		50.00
7/1/57	John Doe	50.00	232		0.00
7/15/57	John Doe	50.00	233		50.00
8/1/57	John Doe	50.00	234		0.00
8/15/57	John Doe	50.00	235		50.00
9/1/57	John Doe	50.00	236		0.00
9/15/57	John Doe	50.00	237		50.00
10/1/57	John Doe	50.00	238		0.00
10/15/57	John Doe	50.00	239		50.00
11/1/57	John Doe	50.00	240		0.00
11/15/57	John Doe	50.00	241		50.00
12/1/57	John Doe	50.00	242		0.00
12/15/57	John Doe	50.00	243		50.00
1/1/58	John Doe	50.00	244		0.00
1/15/58	John Doe	50.00	245		50.00
2/1/58	John Doe	50.00	246		0.00
2/15/58	John Doe	50.00	247		50.00
3/1/58	John Doe	50.00	248		0.00
3/15/58	John Doe	50.00	249		50.00
4/1/58	John Doe	50.00	250		0.00
4/15/58	John Doe	50.00	251		50.00
5/1/58	John Doe	50.00	252		0.00
5/15/58	John Doe	50.00	253		50.00
6/1/58	John Doe	50.00	254		0.00
6/15/58	John Doe	50.00	255		50.00
7/1/58	John Doe	50.00	256		0.00
7/15/58	John Doe	50.00	257		50.00
8/1/58	John Doe	50.00	258		0.00
8/15/58	John Doe	50.00	259		50.00
9/1/58	John Doe	50.00	260		0.00
9/15/58	John Doe	50.00	261		50.00
10/1/58	John Doe	50.00	262		0.00
10/15/58	John Doe	50.00	263		50.00
11/1/58	John Doe	50.00	264		0.00
11/15/58	John Doe	50.00	265		50.00
12/1/58	John Doe	50.00	266		0.00
12/15/58	John Doe	50.00	267		50.00
1/1/59	John Doe	50.00	268		0.00
1/15/59	John Doe	50.00	269		50.00
2/1/59	John Doe	50.00	270		0.00
2/15/59	John Doe	50.00	271		50.00
3/1/59	John Doe	50.00	272		0.00
3/15/59	John Doe	50.00	273		50.00
4/1/59	John Doe	50.00	274		0.00
4/15/59	John Doe	50.00	275		50.00
5/1/59	John Doe	50.00	276		0.00
5/15/59	John Doe	50.00	277		50.00
6/1/59	John Doe	50.00	278		0.00
6/15/59	John Doe	50.00	279		50.00
7/1/59	John Doe	50.00	280		0.00
7/15/59	John Doe	50.00	281		50.00
8/1/59	John Doe	50.00	282		0.00
8/15/59	John Doe	50.00	283		50.00
9/1/59	John Doe	50.00	284		0.00
9/15/59	John Doe	50.00	285		50.00
10/1/59	John Doe	50.00	286		0.00
10/15/59	John Doe	50.00	287		50.00
11/1/59	John Doe	50.00	288		0.00
11/15/59	John Doe	50.00	289		50.00
12/1/59	John Doe	50.00	290		0.00
12/15/59	John Doe	50.00	291		50.00
1/1/60	John Doe	50.00	292		0.00
1/15/60	John Doe	50.00	293		50.00
2/1/60	John Doe				

39.	Sandy loam		deer, quail, dove, turkey	2a.rye, 2wheat	shrub, S.S.
40.	Sandy loam		deer, quail, dove, turkey	2a.rye, 2oats	shrub, S.S.
41.	Sandy loam, good land	pecan grove	deer, quail, dove, turkey	1rye, 1clover, 1barley	shrub, S.S.
42.	White sand, poor	stumps pushed	quail	4a.rye, 1 P. mix	
43.	Damp black sand	clover	deer, quail, dove, turkey	2a.rye, 2clover	shrub, S.S.
44.	White sand, yellow subsoil	uncleared	deer, quail, dove, turkey	2a.rye, loats, lwheat	shrub, S.S.
45.	Same		deer, quail, dove, turkey	2a.rye, loats, lbarley	shrub, S.S.
46.	Sandy loam, good land		deer, quail, dove, turkey	1a.rye, lwheat, 2clover	shrub, S.S.
47.	Sandy		deer, quail, dove, turkey	4a.rye	shrub, S.S.
48.	Sandy loam	powerline	deer, quail, dove, turkey	4a.rye	shrub, S.S.
49.	Sandy loam, good farmland	uncleared	deer, quail, dove, turkey	2a.rye, 2wheat	shrub, S.S.
50.	Light sand	uncleared	deer, quail, dove, turkey	2a.rye, 2barley	
51.	Sterile sand (wet)				
	white sand hard pan	pushed off, poor	deer, quail, dove, turkey	4a.rye	shrub, S.S.*
52, 53, 54, 55	same as 51				
56.	Black soil (wet)	pushed, not cut	deer, quail, dove, turkey	2a.wheat, 2rye, 2clover	shrub, S.S.*
57.	Sand	cleared, clover	deer, quail, dove, turkey	2a.rye, 2comm. lesp.	shrub, S.S.
58.	Same as 32 (uncleared)	bottom		2rye, 2clover	
59.	Same as 32 (cleared)			3rye, 1clover	shrub, S.S.
60.	Sand	uncleared	deer, quail, dove, turkey	2a.rye, 2comm. lesp.	shrub, S.S.
61.	Light sand (fair farm)	uncleared	deer, quail, dove, turkey	1rye, lwheat, loats, lbarley	
62.	Need to locate	uncleared		4a.rye	shrub, S.S.*
63.	Heavy sand (clover ok)	partly cleared	deer, quail, dove, turkey	2a.rye, 1clover, 1barley	

*Signifies shrub-sericea plots to be established in the 1966-67 planting season.

100	Sandy loam	bees	grass	down	loam	2.00
101	Sandy loam	bees	grass	down	loam	2.00
102	Sandy loam, good kind	bees	grass	down	loam	2.00
103	Light sand, poor	grass	brush	down	loam	2.00
104	Dark black sand	clever	grass	down	loam	2.00
105	White sand, yellow when wet	loam	grass	down	loam	2.00
106	Red sand, red sand	loam	grass	down	loam	2.00
107	Sandy loam	loam	grass	down	loam	2.00
108	Sandy loam, good	loam	grass	down	loam	2.00
109	Light sand	loam	grass	down	loam	2.00
110	Light sand (wet)	loam	grass	down	loam	2.00
111	Black soil (wet)	loam	grass	down	loam	2.00
112	Light sand	loam	grass	down	loam	2.00
113	Light sand (washed)	loam	grass	down	loam	2.00
114	Light sand (washed)	loam	grass	down	loam	2.00
115	Light sand (washed)	loam	grass	down	loam	2.00
116	Light sand (washed)	loam	grass	down	loam	2.00
117	Light sand (washed)	loam	grass	down	loam	2.00
118	Light sand (washed)	loam	grass	down	loam	2.00
119	Light sand (washed)	loam	grass	down	loam	2.00
120	Light sand (washed)	loam	grass	down	loam	2.00

Light sand (washed) to be established in the...

ANNUAL SEED MIXTURE FORMULAE

LOWLAND MIXTURE

<u>FORMULA</u>		<u>QUANTITY TO MIX 500 LBS.</u>
Mile	1.00 lbs.	100 lbs.
Millet	2.00 lbs.	200 lbs.
Korean Lespedeza	1.60 lbs.	160 lbs.
Buckwheat	.40 lbs.	40 lbs.
	<u>5.00 lbs.</u>	<u>500 lbs.</u>

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

FOOTNOTES

QUANTITY TO NEW 500 lbs.
100 lbs.
200 lbs.
300 lbs.
40 lbs.
500 lbs.

1.00 lbs.
2.00 lbs.
3.00 lbs.
4.00 lbs.
5.00 lbs.

FORMULA
Milk
Milk
Lactose
Protein

COOPERATIVE PLAN
CONSERVATION AND DEVELOPMENT OF FISH AND WILDLIFE
U. S. MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA 28542

1. Authority

a. In accordance with the authority contained in Public Law 85-337, approved February 28, 1958, and in Public Law 86-797, approved September 15, 1960, the Department of Defense, the Department of Interior, and the State of North Carolina, through their duly designated representatives, whose signatures appear below, approve the following Cooperative Plan for the protection, development, and management of fish and wildlife resources on Marine Corps Base, Camp Lejeune, North Carolina.

b. Under the authority delegated to him by higher echelons of command, the Commander, Marine Corps Base, hereinafter referred to as the Commanding General, is recognized as the official representative of the Commandant of the Marine Corps.

c. Under the authority vested in him, the Regional Director, Bureau of Sports Fisheries and Wildlife, hereinafter referred to as the Regional Director, is recognized as the official representative of Sports Fisheries and Wildlife.

d. Under the authority vested in him by the State of North Carolina, the Executive Director, North Carolina Wildlife Resources Commission, hereinafter referred to as the Executive Director, is recognized as the official representative of the State of North Carolina.

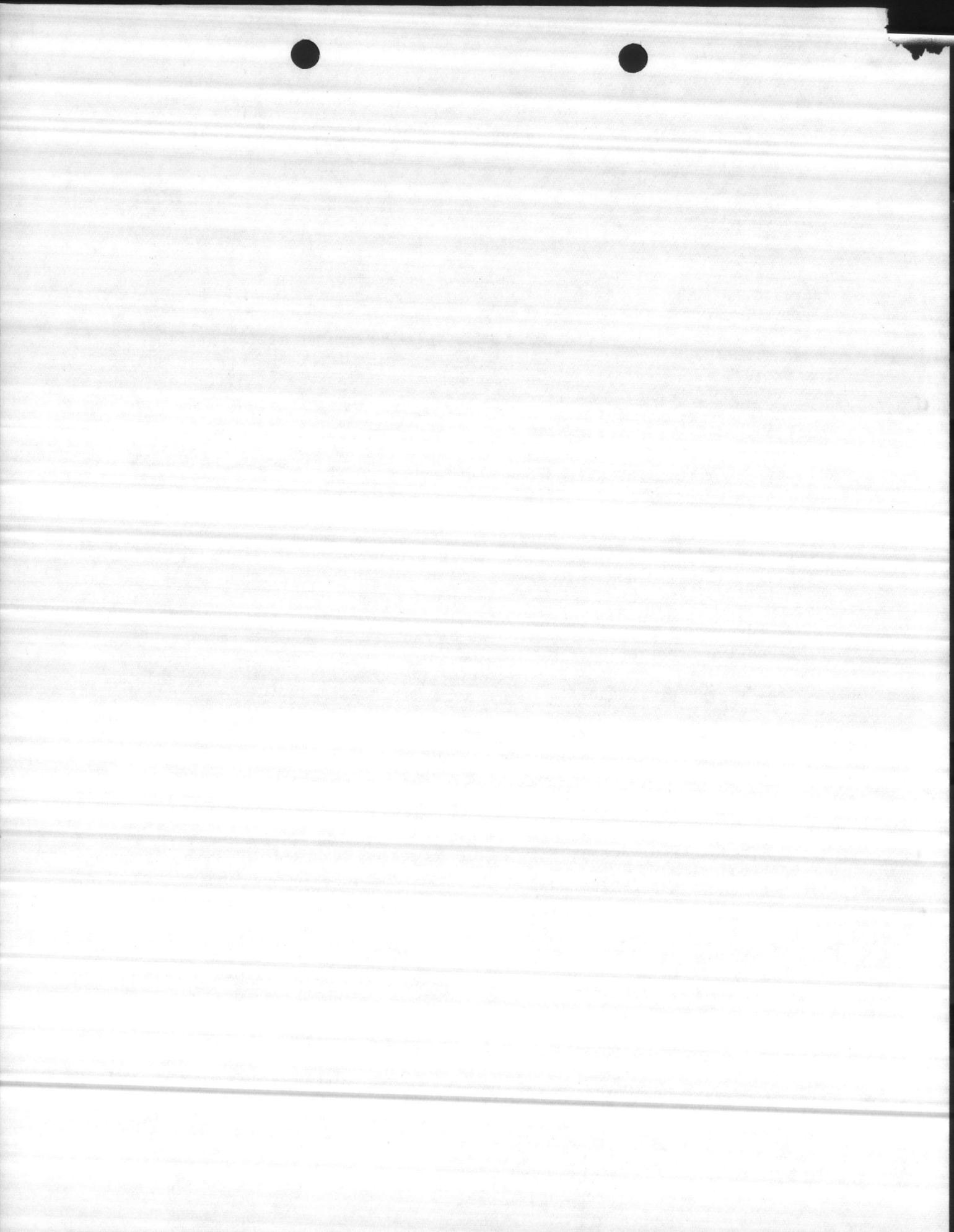
e. By definition, action by and to the Marine Corps shall be understood to refer specifically to the U. S. Marine Corps Base, Camp Lejeune, North Carolina, hereinafter referred to as the Installation.

2. The Cooperative Plan

a. Inventory of Resources: An inventory of fish and wildlife resources has been conducted and is attached to this Cooperative Plan in the form of a long-range fish and wildlife management plan as Exhibit No. 1.

b. The Bureau of Sports Fisheries and Wildlife, the North Carolina Wildlife Resources Commission, and the Marine Corps Installation agree to assist together in preparing and implementing a progressive program of fish and wildlife conservation for the Installation, as follows:

(1) The Bureau of Sports Fisheries and Wildlife will render technical assistance and professional advice concerning the management of fish and wildlife, and provide fish for restocking ponds and lakes through its Federal Hatchery at Edenton, North Carolina.



(2) The North Carolina Wildlife Resources Commission will render technical assistance and professional advice concerning the management of wildlife, provide game seed mixture and plants as needed and as available for small game plantings, and provide fish for restocking streams through its State Hatchery at Fayetteville, North Carolina.

(3) The Marine Corps Installation will execute the Fish and Wildlife Management Plan, provide labor, equipment, and materials for habitat improvement and development, work effectively and in harmony with local, State, and Federal conservation officials, provide within manageable quotas for controlled public access to the Installation for the purpose of hunting and fishing and regulate hunting and fishing in accordance with applicable local, State, and Federal laws and regulations.

c. Technical assistance and professional advice will be tendered the Installation by the North Carolina Wildlife Resources Commission and the Bureau of Sports Fisheries and Wildlife, as specified in Exhibit No. 2.

d. Licenses, permits and fees shall be required in accordance with applicable military regulations and laws of the State of North Carolina and the United States.

e. An annual meeting will be held between Installation officials, representatives of the North Carolina Wildlife Resources Commission, and the Bureau of Sports Fisheries and Wildlife during the month of January (a specific date to be set by the first of January each year) to discuss updating fish and wildlife plans and reviewing accomplishments of the past year.

This Cooperative Plan, upon its adoption as witnessed by its execution, will be in full force and effect for an indefinite period. The Plan is subject to amendment or revision as may be agreed upon by all parties represented. A request for an amendment or revision to the Cooperative Plan may originate with any one of the represented parties. This Plan supersedes the Cooperative Plan of June 19, 1963.

FOR THE DEPARTMENT
OF DEFENSE

By *E. B. Wheeler* E. B. WHEELER
Title: Commanding General
Marine Corps Base, Camp Lejeune
North Carolina 28542

Date 6 January 1969

FOR THE STATE OF NORTH CAROLINA

By *Coyde P. ...*
Title: Executive Director, Wildlife Resources
Commission, Raleigh, North Carolina

Date 2/25/69

FOR THE DEPARTMENT OF INTERIOR

By *W. P. Brown*
Title: Regional Director, U. S.
Department of the Interior, Fish
and Wildlife Service, Bureau of
Sport Fisheries and Wildlife,
Peachtree-Seventh Building,
Atlanta, Georgia 30323

Date FEB 10 1969

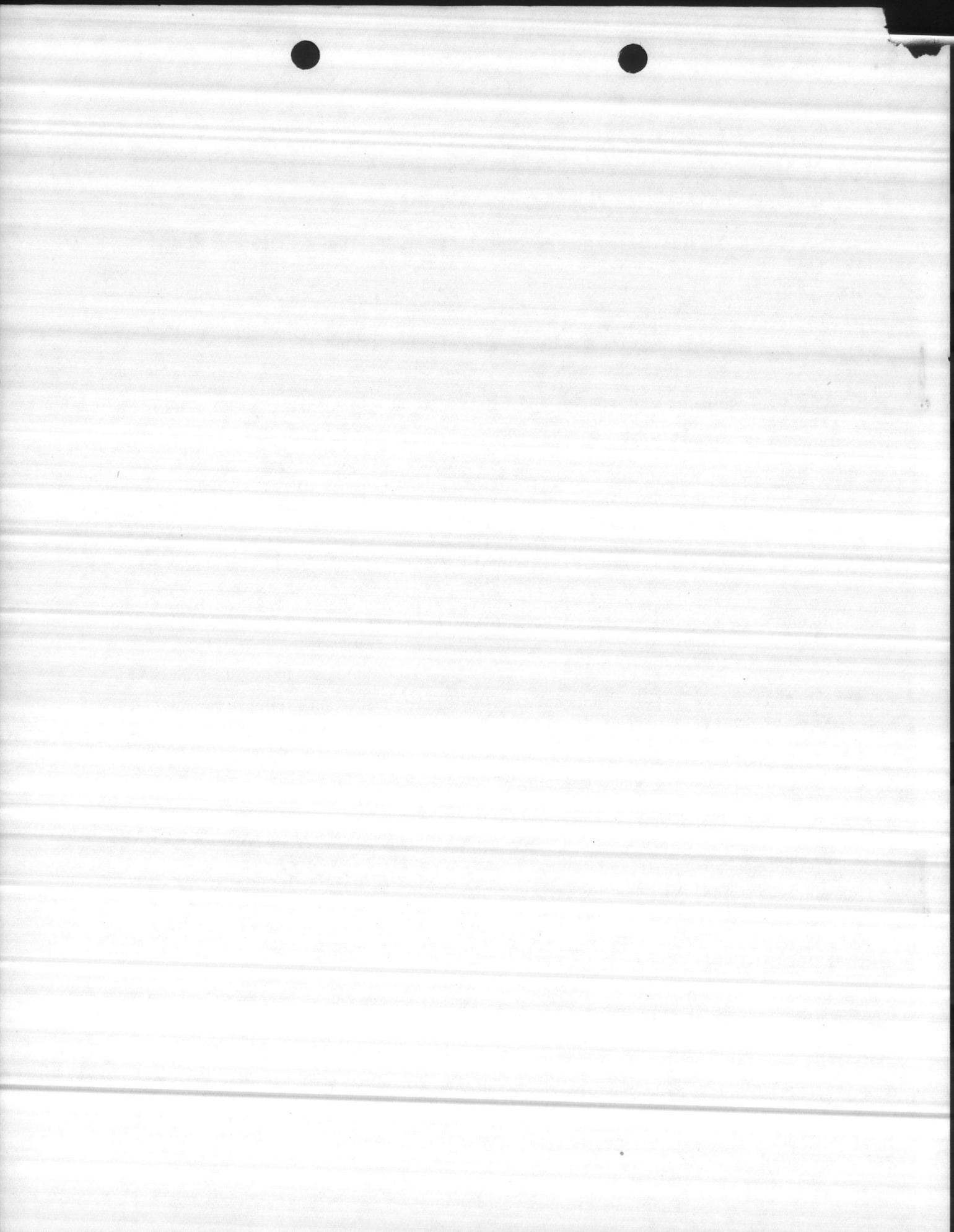


EXHIBIT NO. 1

WILDLIFE MANAGEMENT PLAN

MARINE CORPS BASE

CAMP LEJEUNE, NORTH CAROLINA

JANUARY 1969

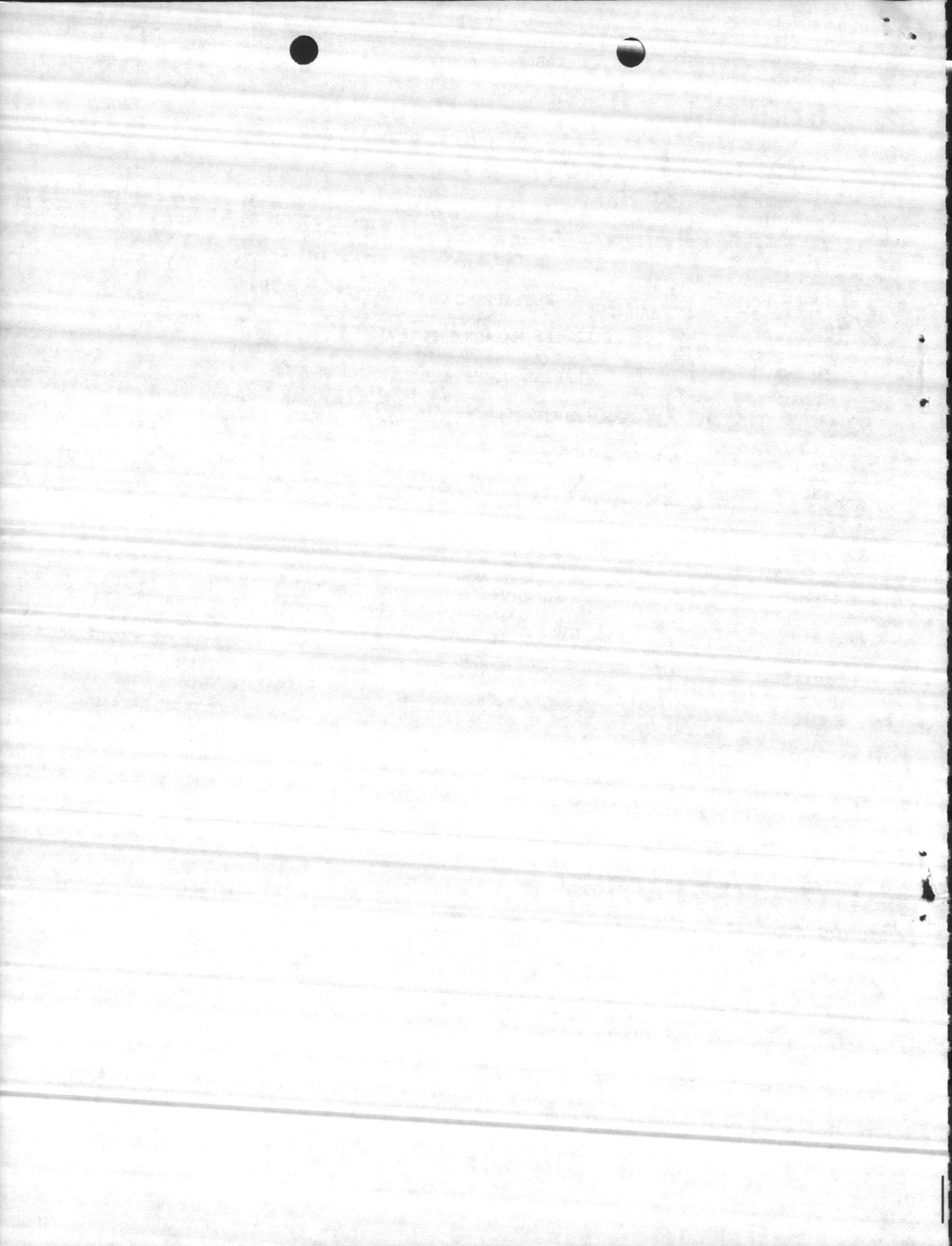
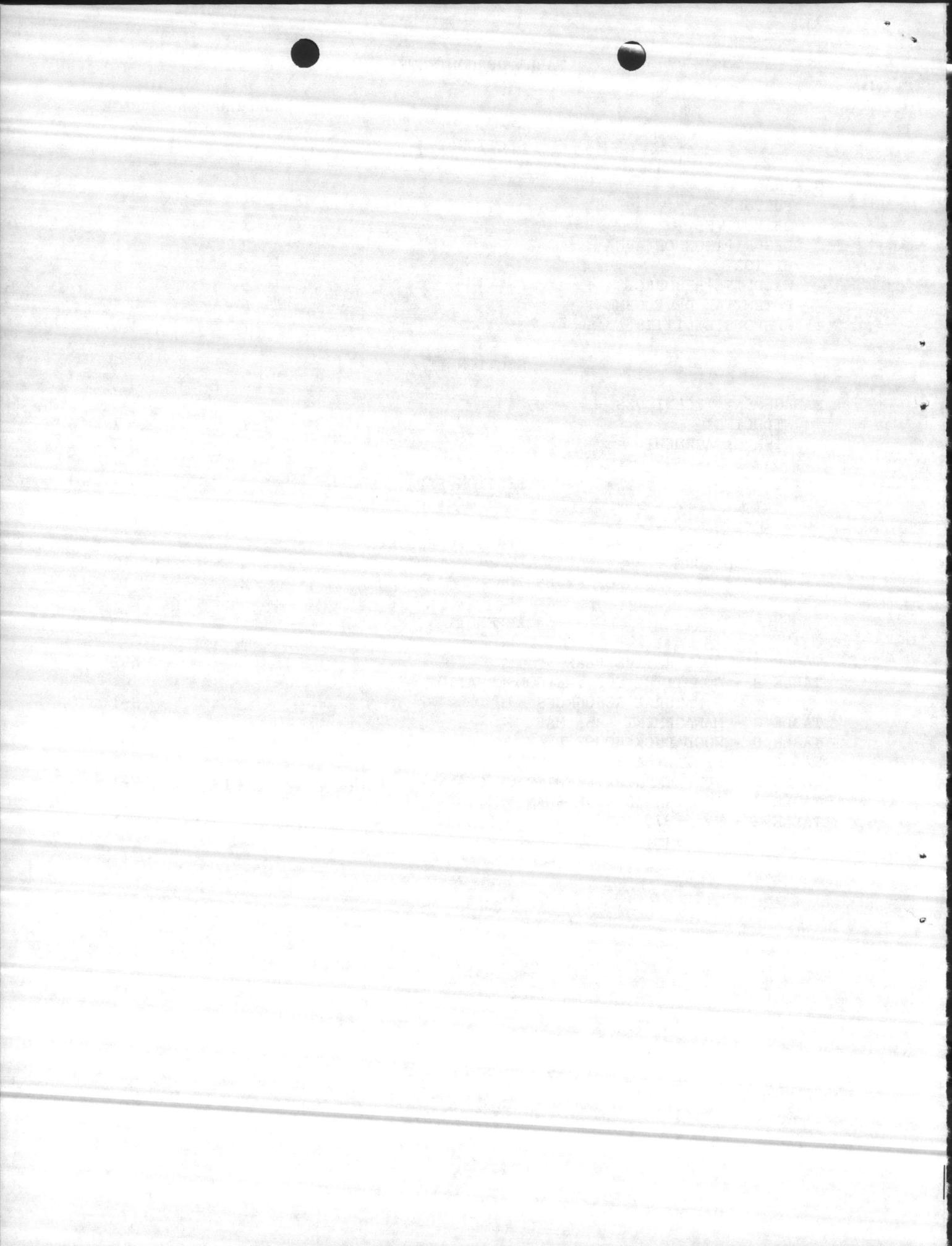


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SECTION I
GENERAL

1. Purpose. This plan contains information relating to the scientific management of wildlife which will serve as a guide to insure sustained annual crops of game for recreational use.

2. Objectives

a. To provide more outdoor sport through hunting, fishing, and related recreational interests for more people with an equal opportunity to enjoy them.

b. To encourage and give incentive to personnel for using the recreational benefits relating to wildlife.

3. Description of Area. The Marine Corps Base, Camp Lejeune, North Carolina, is on the Atlantic Seaboard approximately 50 miles north of Wilmington, North Carolina, and covers 173.86 square miles. There are 95,000 acres of land and 26,000 acres of water. The perimeter measures approximately 68 miles.

Camp Lejeune is bordered on the east by approximately 14 miles of ocean front. The Intracoastal Waterway traverses the base to the extent of nearly 15 miles along the eastern perimeter. Numerous tidal creeks empty into New River which extends inland from the ocean.

a. Soils. The soil type of this "coastal plain" country is generally classified as sandy loam. Some of the soil is low in organic matter and low in fertility, but most of the land produces abundant crops of timber and foods for wildlife.

b. Topography. Surface relief ranges from flat (marsh areas immediately adjacent to tidal creeks) to slightly rolling. The land is laced with deep wooded forests on the better upland range to inaccessible bottom-land swamps and pocosins.

The terrain adjacent to the numerous small ponds and marsh areas is flat and woodlands extend to the very edge of ponds and marshes. The highest ridges are generally located through the central portion of the area. Principal watershed drainage areas are New River, Northeast Creek, Southwest Creek, French Creek, Bear Creek, and Duck Creek.

c. Climate. The climate ranges from long hot summers to mild winters. Average monthly precipitation and temperatures are illustrated in Figures 1 and 2. The average annual precipitation is approximately 47 inches. The average yearly temperature is 61° and the growing season is approximately 230 days. Severe tropical storms sometimes move up the coast and cause varying amounts of damage to wildlife.

Figure 1. Average Monthly Rainfall

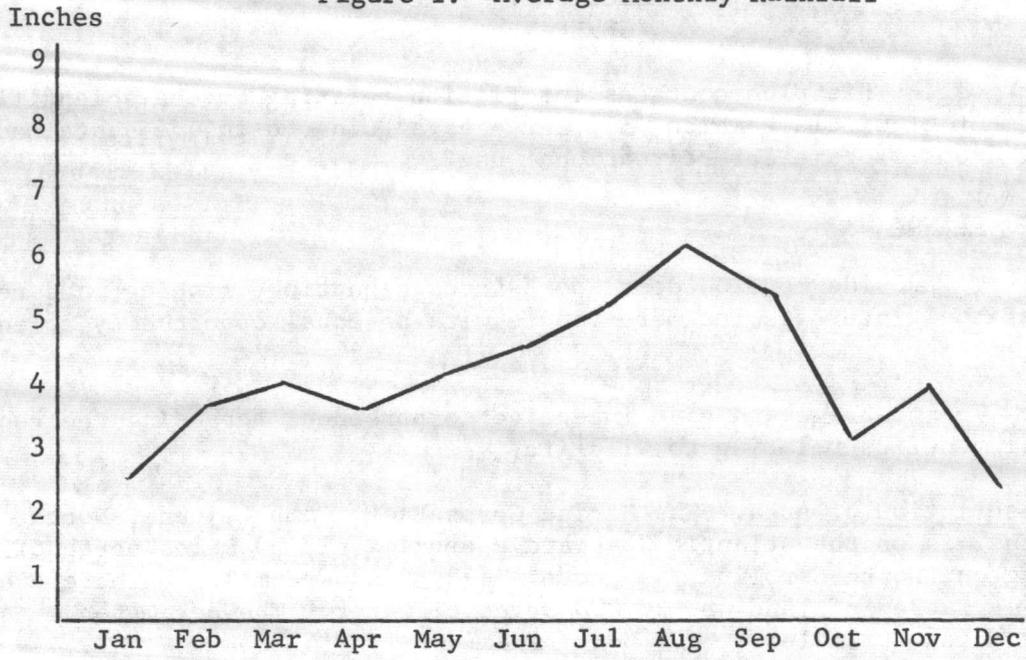
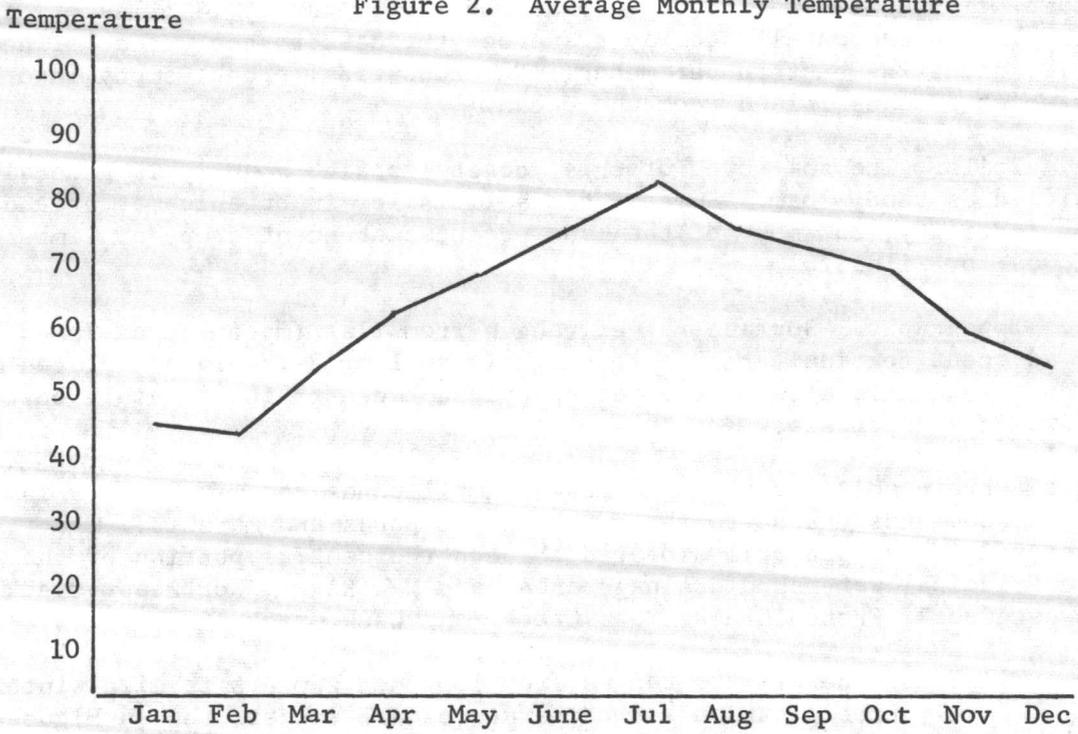


Figure 2. Average Monthly Temperature



d. Vegetation. Native plants common to Camp Lejeune that are useful to wildlife are listed below:

Trees
White Oak (Quercus alba)
Live Oak (Q. virginiana)
Black Oak (Q. velutina)
Red Oak (Q. borealis)
Turkey Oak (Q. laevis)
Water Oak (Q. nigra)
Yellow Poplar (Liriodendron tulipifera)
Sweet Gum (Liquidambar styraciflua)
Red Maple (Acer rubrum)
Holly (Ilex opaca)
Black Gum (Nyssa sylvatica)
Hornbeam (Ostrya virginiana)
Longleaf Pine (Pinus palustris)
Loblolly Pine (P. taeda)
Sweet Bay (Magnolia virginiana)
Dogwood (Cornus florida)
Sassafras (Sassafras albidum)
Persimmon (D. virginiana)
Sourwood (Oxyolendrum arboreum)
Cypress (Taxodium distichum)
Ash (F. nigra)

Shrubs
Wax Myrtle (Myrica cerifera)
Gallberry (Ilex glabra)
Red Bay (Persea pubescens)
Cyrilla (Cyrilla racemiflora)

Vines and Herbs
Partridge Pea (Cassia spp.)
Beggar Lice (Desmodium spp.)
Lespedeza (Lespedeza spp.)
Milk Pea (Galactia volubile)
Grape (Vitis spp.)
Blueberries (Vaccinium spp.)
Smilax (Smilax spp.)
Honeysuckle (Lonicera japonica)

e. Military Use. Camp Lejeune houses three Marine commands and two Navy commands: Marine Corps Base; Force Troops, FMF, Atlantic; 2d Marine Division, FMF; Naval Hospital; and Naval Medical Field Research Laboratory.

Its mission is to provide housing, training facilities, logistical support and certain administrative support for Fleet Marine Force units and other units assigned; to conduct specialized schools and other training as directed; to receive, process and conduct combat training as directed for personnel to be assigned to replacement units; to organize replacement units for shipment overseas as directed; and to provide logistic support to other Marine Corps activities as directed.

4. History

a. Camp Lejeune has had a program of wildlife management in effect for many years. Actual field work for the program began in 1944, but plans were not put into effect until two years later. Administrators and participants of the early program found it necessary to experiment in properly establishing the most desirable types of wildlife plantings for the area. Their findings placed the program in the proper perspective and helped make the present management techniques more complete.

b. Cooperation with state and federal wildlife officials is excellent in every respect of the wildlife management program. The Cooperative Plan (Table A) has been formulated with state and federal wildlife officials to benefit the management, development, research, and enforcement aspects of the wildlife program. A Committee for Conservation of Natural Resources (Table B) has been established to assist and advise the Commanding General in implementing the provisions of the Secretary of the Navy instructions on conservation and management of the fish and wildlife resources of Camp Lejeune.

5. Wildlife Resources

a. Camp Lejeune affords large areas which can be used for hunting, fishing, and other outdoor activities. No hunting areas include housing areas, built-up areas and impact areas. Hunting is allowed in buffer zones near impact areas when firing is secured. (Table C).

b. Fisheries management practices are in effect in nine fresh water ponds. These lakes vary in size from one-half to three acres with a total of 17 acres under management. These are shallow natural lakes which were of low fertility and productivity when reclaimed.

c. Wildlife species most common to Camp Lejeune:

Game Birds and Animals

Whitetail Deer (Odocoileus virginianus)
Black Bear (Ursidae americanus)
Squirrel (Sciurus spp.)
Rabbit (Sylvilagaos spp.)
Red Fox (Vulpes fulva)
Gray Fox (Urocyon cinereogenteus)
Quail (Colinus virginianus)
Turkey (Meleagris gallopardo)

Fur Bearing Animals

Mink (Mustela vison)
Otter (Lutra canadensis)
Muskrat (Ondatra zibethica)
Skunk (Mephitis mephitis)
Raccoon (Procyon lotor)
Opossum (Didelphis virginiana)
Bobcat (Lynx rufas)

Migratory Game Birds

Dove (Zenaidura macoura)
Snipe (Capella delicata)
Woodcock (Philohela minor)
Rail (Rallus longirostris)
Wood Duck (Aix sponsa)
Black Duck (Antilope cervicapra)
Canada Goose (Branta canadensis)
Mallard (Anas platyrhynchos)
Green-Winged Teal (Anas carolinense)
Ruddy Duck (Oxyura jamaicensis)
Hooded Merganser (Lophodytes cucullatus)
American Merganser (Mergus merganser americanus)
Red-breasted Merganser (M. serrator)

Canvasback (N. valisineria)
Bufflehead (Bucephala albeola)
Lesser Scaup (Aythya affinis)
Pintail (Anas acuta)
Greater Scaup (Aythya marila)
Ring-Neck Duck (Aythya collaris)
Coot (Fulica americana)

Game Fish

Largemouth bass (Micropterus salmoides)
Bluegill (Lepomis macrochirus)
Redbreast (Lepomis auritus)
Pickrel (Esox spp.)
Redear (Lepomis microlophus)
Warmouth (Chaenobryttus gulosus)
Black crappie (Pomoxis nigromaculatus)
Yellow perch (Perca flavescens)
Pumpkinseed (Lepomis gibbosus)
Flier (Centrarchus macropterus)
Striped bass (Roccus saxatilis)

Non-Game Fish

Carp (Cyprinus carpio)
Bowfin (Amia calva)
Shad (Dorosoma cepedianum)
Catfish (Ictalurus spp.)
Longnose gar (Lepisosteus osseus)

Many other species of migratory bird life frequents Camp Lejeune which cannot be hunted but contribute to the study of bird watching.

d. Population density and range condition:

<u>Species</u>	<u>Population</u> (Estimated)	<u>Range</u>
Whitetail deer	2,400	Good
Black bear	22	Fair
Squirrel	18,920	Good
Rabbit	11,875	Fair
Red fox	50	Fair
Grey fox	250	Excellent
Quail	3,000	Fair
Turkey	425	Good
Mink	225	Excellent
Otter	225	Excellent
Muskrat	500	Fair
Skunk	4,785	Excellent
Raccoon	9,500	Excellent
Opossum	4,325	Excellent
Bobcat	148	Excellent
Dove	1,200	Fair
Rails	2,500	Excellent
Duck	2,000	Good

6. Potential Development

a. Since wildlife populations are primarily dependent on woodlands for food and cover, forestry practices must be programmed to provide optimum conditions for habitat improvement. Silvicultural practices and activities which are unnecessarily destructive to wildlife habitat should be modified and reduced. Woodlands should not be planted or allowed to grow to single species.

b. Population levels will depend upon such factors as quantity and quality of food and cover, water resources, productivity and composition and condition of stock; population levels and their relationship to

capacity of the range to support a given population; mortality factors, such as predation, disease and removals through hunting.

c. Projected plans include the development of a salt marsh impoundment for waterfowl and fresh water fisheries management, an additional green tree impoundment for waterfowl, construction of a 200 acre lake on Wallace Creek, and establishing 16 more sites for wildlife plantings.

d. The Camp Lejeune hunting and fishing regulations are established in conjunction with state and federal regulations relating to the taking of wildlife.

7. Responsibilities. Implementation of the wildlife management program is the primary responsibility of the Wildlife Technician and the Base Forester. These responsibilities include establishing hunting quotas, hunting and fishing regulations, sale of base hunting and fishing permits, habitat development and preservation, predator control and compliance of administrative policies of the Committee for the Conservation of Natural Resources.

SECTION II
MANAGEMENT TECHNIQUES

1. Wildlife. The management of game birds and animals will be accomplished by the preservation of natural habitat, manipulation of forestry silvicultural practices, the enforcement of fish and game regulations, and development of annual and perennial plantings for birds and animals.

a. Development. This phase of the program will involve establishing perennial border food and cover plantings adjacent to annual and perennial plantings for small game (quail and rabbits), food plots for large game (deer and turkey), and feeding, resting and nesting areas for migratory birds.

(1) Some small game plantings will consist of perennial seed and seedling plantings of various species of lespedeza (Lespedeza spp.), part-ridge pea (Cassia fasciculata), beggar lice (Desmodium spp.) and other desirable plantings. Seed plantings will be established in spring after the danger of frost, and the seedlings will be planted during the dormant period. Plots will be approximately one-half acre in size and will be fertilized with 400 pounds of 8-8-8 per acre. Shrub lespedeza (Lespedeza bicolor) will be cut back every third year during February with 400 pounds of 8-8-8 per acre applied at the time of cutting.

(2) Other small game plantings will be established adjacent to perennial seed and seedling plantings. These plantings will consist of annual mixtures such as millet (Panicum spp.), milo (Andropogon sorghum), soybeans (Glycine spp.), buckwheat (Fagopyrum esculentum), cowpeas (Vigna spp.) and other desirable annuals. Fifteen of these plantings will be established in the future. Fertilization rate is 400 pounds of 8-8-8 per acre during planting.

(3) Food plots for large game will also consist of perennial and annual seed plantings. These plantings will be from two to four acres in size. Sixteen new plots will be established in addition to the 47 which presently exist. (Table C). Some food plots for large game will be planted to perennial mixtures of clover (Trifolium spp.) and fescue (Festuca spp.). Annual winter cover crops will be planted consisting of rye (Secale cereale), oats (Avena spp.) and wheat (T. aestivum). Fertilization rates for perennial plantings of clover and fescue will be indicated by soil sample analysis. Annual winter cover crops will be fertilized with 400 pounds of 8-8-8 per acre at the time of planting.

(4) Migratory Birds. Food plantings are established to attract migratory birds during the migration period.

(a) The annual grain plantings that are established for small game are utilized by dove to some extent. Row crop cultivation which are kept relatively free of grass and weeds are essential for dove management. Present seeding application of all plantings is by broadcasting which hinders

heavy utilization by dove. In the event of increased demand for dove hunting areas, cultivated crops of millet and milo will be established.

(b) Waterfowl management will be accomplished by trapping and banding various species of ducks, erection of predator-proof wood duck nesting houses on streams, lakes, and impound areas (Table D) and annual maintenance of the green tree impoundment. The impoundment will be flooded in mid to late September. De-watering will begin in mid to late March which will allow normal tree growth and the appearance of swamp floor flora. This impoundment serves as a feeding, resting and nesting area for migratory wildfowl.

b. Preservation

(1) Natural food and cover retention is of major importance in maintaining the carrying capacity of wildlife that the area will support. Hardwood eradication projects in any timber stand should be discontinued.

(2) Hardwood areas adjacent to branches and small watercourses should be preserved in their natural state or only slightly changed by selective cutting on a strictly controlled basis.

(3) Swamp-type habitat should be preserved in its present condition.

c. Manipulation. Controlled burning is a tool which minimizes the danger of wild fires. This forestry practice is also valuable to modern wildlife management by maintaining optimum conditions for controlling plant succession whereby native legumes, annuals, and tender plants are made available for quail, deer, turkey, and rabbits. A rotation system should be worked out whereby areas could be control-burned every third or fourth year.

d. Research

(1) A limited amount of research is necessary to evaluate the effectiveness of the management program. Reproductive studies, sight counts, track counts, call counts, food habit studies, and seine samples will be conducted to determine population levels.

(2) Spring turkey hunts will be conducted between the mating and nesting season to increase the annual harvest of gobblers and establish a larger harvestable turkey population. Crops, wing tips, spurs, measurements and weights will be collected from each kill for biological study of the flock.

e. Predator Control. A limited trapping program will be conducted to maintain a normal predator-prey relationship. Feral dog and cat populations will also be controlled.

2. Fish Management. Fisheries management is being attempted in nine fresh water lakes. (Table C). All these lakes were of poor quality (low PH and total hardness) when first reclaimed. Continued emphasis will involve the management of these lakes, the management of proposed lake on Wallace Creek, and fisheries management in the proposed salt marsh impoundment. Fresh water lakes will be treated with the following management practices:

a. Fertilization. Several benefits are provided by applying fish pond fertilizer (20-20-5) at the rate of 40 pounds per surface acre from March through September as indicated in Table E.

(1) Lake fertilization produces a "bloom" of plankton algae that prevents the development of filamentous algae and shades out submersed aquatic vegetation.

(2) The microscopic "bloom" produces organisms that are eaten by insect larvae which form the main supply food for small fish, thereby increasing food producing capacity.

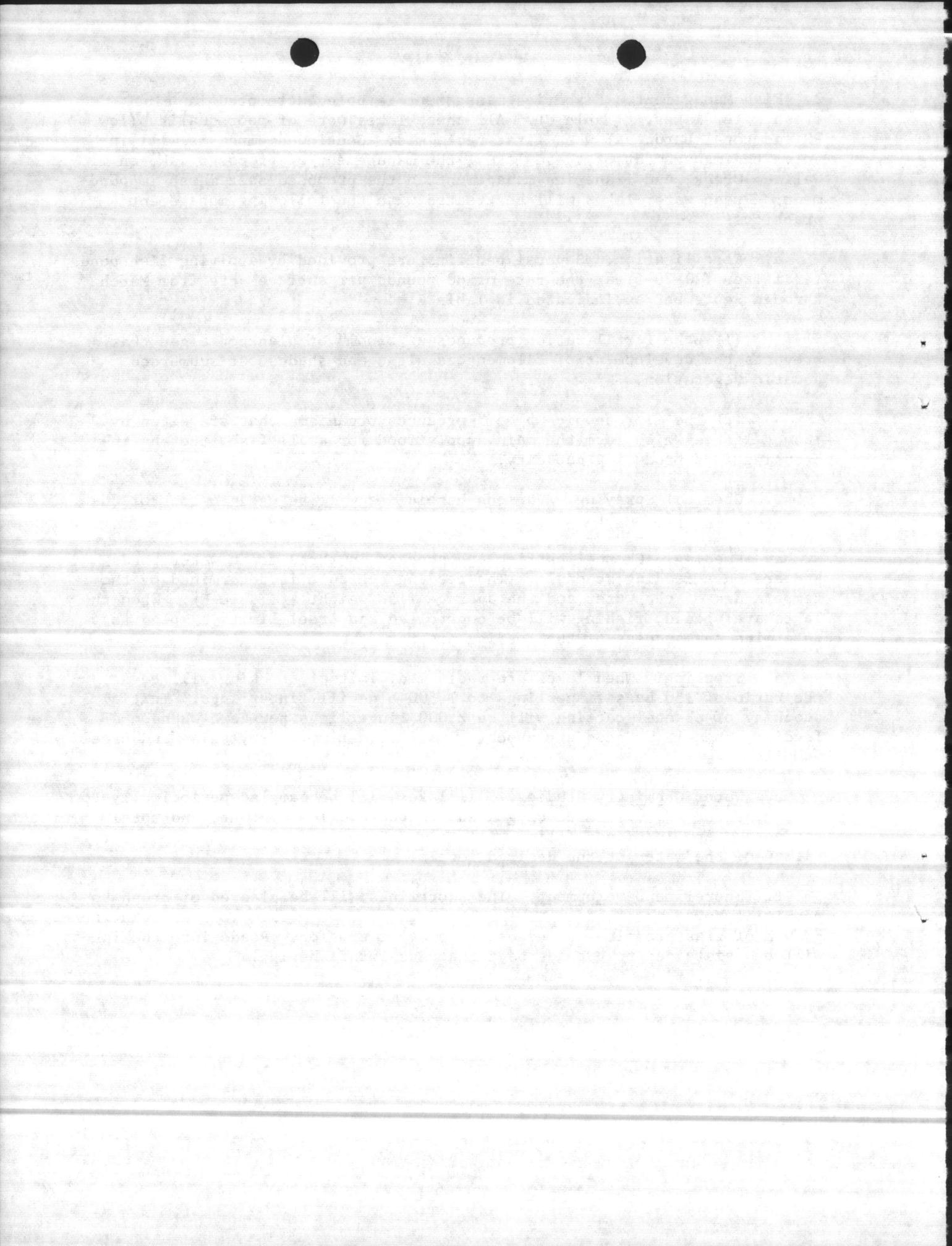
b. Chemical Spraying. Various herbicides will be used to control undesirable aquatic vegetation.

c. Feeding. Channel catfish are stocked in three fresh water ponds and are on a feeding schedule. The feeding schedule is determined by the temperature of the water and the average fish weight. (Table F). When the lakes are opened, fishing will be controlled and creel limits sampled to determine the success of the feeding program.

d. Stocking. When lakes are reclaimed, initial stocking will be at the ratio of 150 bass fingerlings to 1,500 bluegill fingerlings. Initial stocking of channel catfish will be 2,000 fingerlings per acre when on a feeding schedule. Secondary stocking will be determined by seine and creel samples.

e. Water Chemistry Studies. All lakes will be sampled periodically to determine the PH, dissolved oxygen and carbon dioxide content, and total hardness. Applications of lime will be made when necessary to keep the fertility of the water at the desired levels.

f. Shoreline Development. The shorelines will be cleared of brush to permit improved access for fishermen and management work. This will invite growth of grass to firm the edges and prevent erosion. Roads into the lakes will be maintained to provide better access for fishermen.



SECTION III
BUDGET

1. Anticipated Long Range and FY 69-70 Budget and Work Plans
 - a. Long Range Work Plan. Table G.
 - b. FY 69-70 Work Plan. Table H.
2. Sources of Funds for FY 69-70
 - a. Appropriated: \$3,000.00
 - b. Nonappropriated: Sale of hunting and fishing permits - \$10,000.00

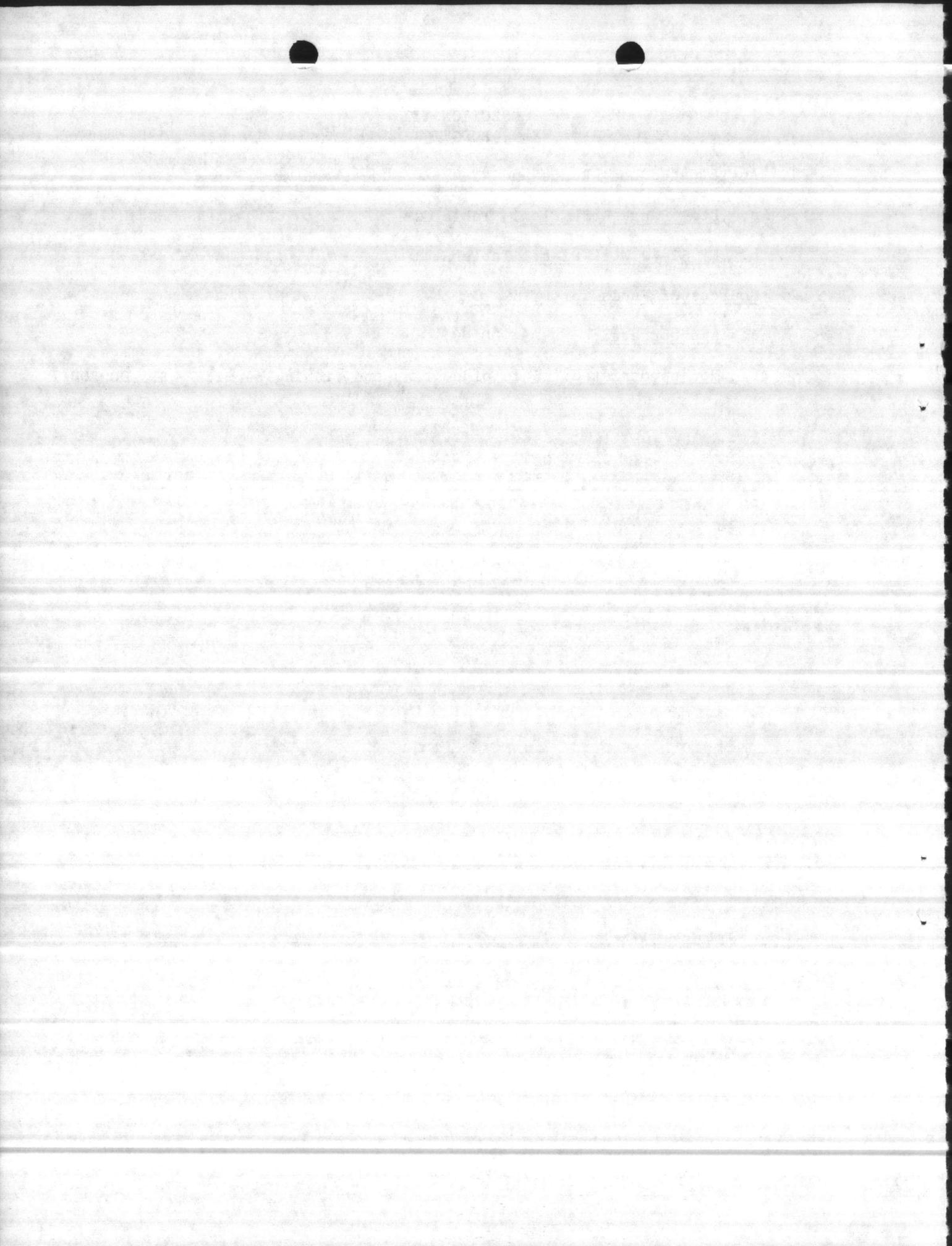


TABLE A
COOPERATIVE PLAN

1. The following agencies will be responsible for providing the Installation Commander with technical advice, assistance, and related services in fish and wildlife management:

a. Regional Director, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, Peachtree-Seventh Building, Atlanta, Georgia 30323 (Fishery Management Program)

b. Executive Director, North Carolina Wildlife Resources Commission, Box 2919, Raleigh, North Carolina. (Wildlife Management)

- (1) North Carolina Wildlife Resources Commission
Mr. Grady L. Barnes, Eastern Refuge Supervisor,
1201 Forest Drive, New Bern, North Carolina 28560
- (2) North Carolina Wildlife Resources Commission
Mr. Sam Poole, Wildlife Biologist
507 Darby Avenue, Kinston, North Carolina 28501
(Small Game Management)
- (3) North Carolina Wildlife Resources Commission
Mr. Thad Cherry, Wild Turkey Restoration Project Leader,
P. O. Box 683, Sanford, North Carolina 27330
(Wild Turkey Management)
- (4) North Carolina Wildlife Resources Commission
Mr. Paul S. Metters, Wildlife Patrolman,
Box 154, Jacksonville, North Carolina 28540
(Matters of Law Enforcement)

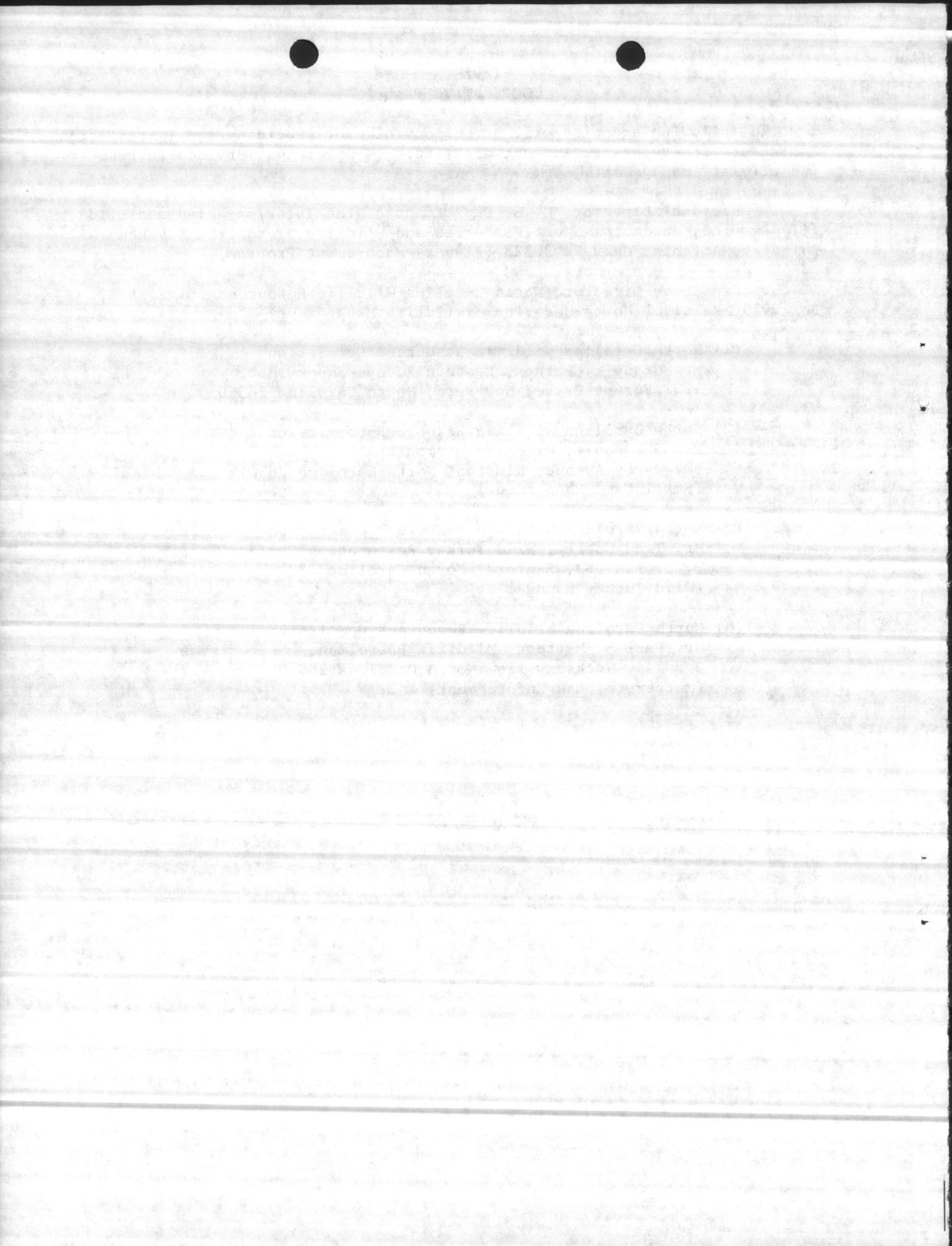


TABLE B
COMMITTEE FOR THE CONSERVATION OF NATURAL RESOURCES

1. General. A Committee for the Conservation of Natural Resources was established in August 1962 to assist and advise the Commanding General in implementing the provisions of the Secretary of the Navy instructions on conservation and management of the fish and wildlife resources of the base.

2. Membership. The committee, chaired by the Assistant Chief of Staff, Facilities, Marine Corps Base, consists of representatives from the 2d Marine Division, FMF; Force Troops, FMF Atlantic; and the following base personnel:

Training Facilities Officer	Forester
Special Services Officer	Security Officer
Veterinarian	Conservation Officer
Maintenance Officer	President, Camp Lejeune Rod and Gun Club
Wildlife Technician	Sergeant Major

3. Responsibilities

a. Conduct annually a comprehensive review of the base hunting, fishing, and boating regulations and make recommendations to the Commanding General regarding changes, additions or deletions required.

b. Review recommendations submitted by the Rod and Gun Club regarding organized deer and bear hunts and make appropriate recommendations to the Commanding General regarding same.

c. Prepare annually for the Commanding General's approval a schedule and procedures for the conduct of organized and controlled hunts for all type wildlife.

d. Prepare annually for the Commanding General's approval a schedule for open seasons, bag and creel limits, in consonance with current federal, state and county laws and regulations.

e. After consultation with federal, state and county fish and wildlife authorities and officially chartered conservation agencies, make recommendations to the Commanding General regarding annual harvest of fish and wildlife on the base.

f. Provide command liaison and establish procedures for scheduling and conducting frequent meetings between representatives of federal, state and county fish and wildlife agencies and officially chartered conservation organizations. The committee will take the initiative to seek out help and to work effectively and in harmony with the above agencies and/or organizations. A full report of such meetings will be included in the minutes of the committee.

g. Ensure, when feasible, that local sportsmen groups are invited to sit in meetings of the committee as guests. The importance of establishing, maintaining, and improving base-community relations cannot be overemphasized.

h. Review annually the cooperative plan between the Base; the Regional Director of the U. S. Fish and Wildlife Service; and the Executive Director, North Carolina Wildlife Resources Commission, and make recommendations to the Commanding General for any desirable changes in the plan.

i. Monitor and make frequent reports to the Commanding General concerning all aspects of the Base Wildlife Food Plot Program.

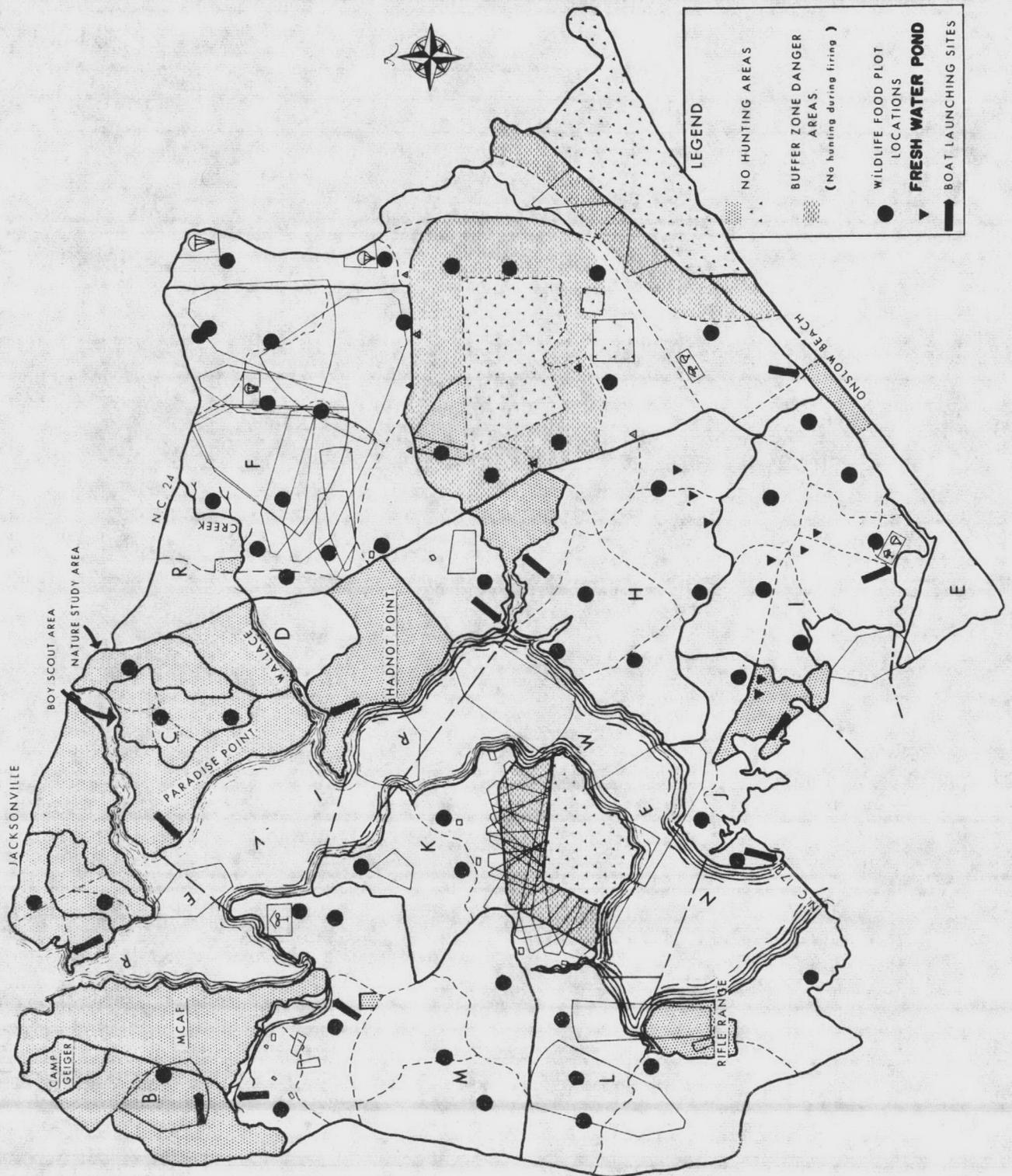
j. Act as command representatives for any inspecting individual or group visiting the base in connection with the Natural Resources Conservation Program.

k. Establish and maintain procedures for accumulating reporting information and prepare all reports for the Commanding General regarding the Base Natural Resources Conservation Program, as required.

l. Develop for promulgation a continuing informational program designed to inform military and civilian persons alike of philosophies, principles, and policies of the Secretary of the Navy as related to the conservation program.

m. Recommend to the Commanding General supplementary instructions, procedures, regulations, etc., regarding any phase or facet of the Natural Resources Conservation Program, as required.

TABLE C
Management Area Map



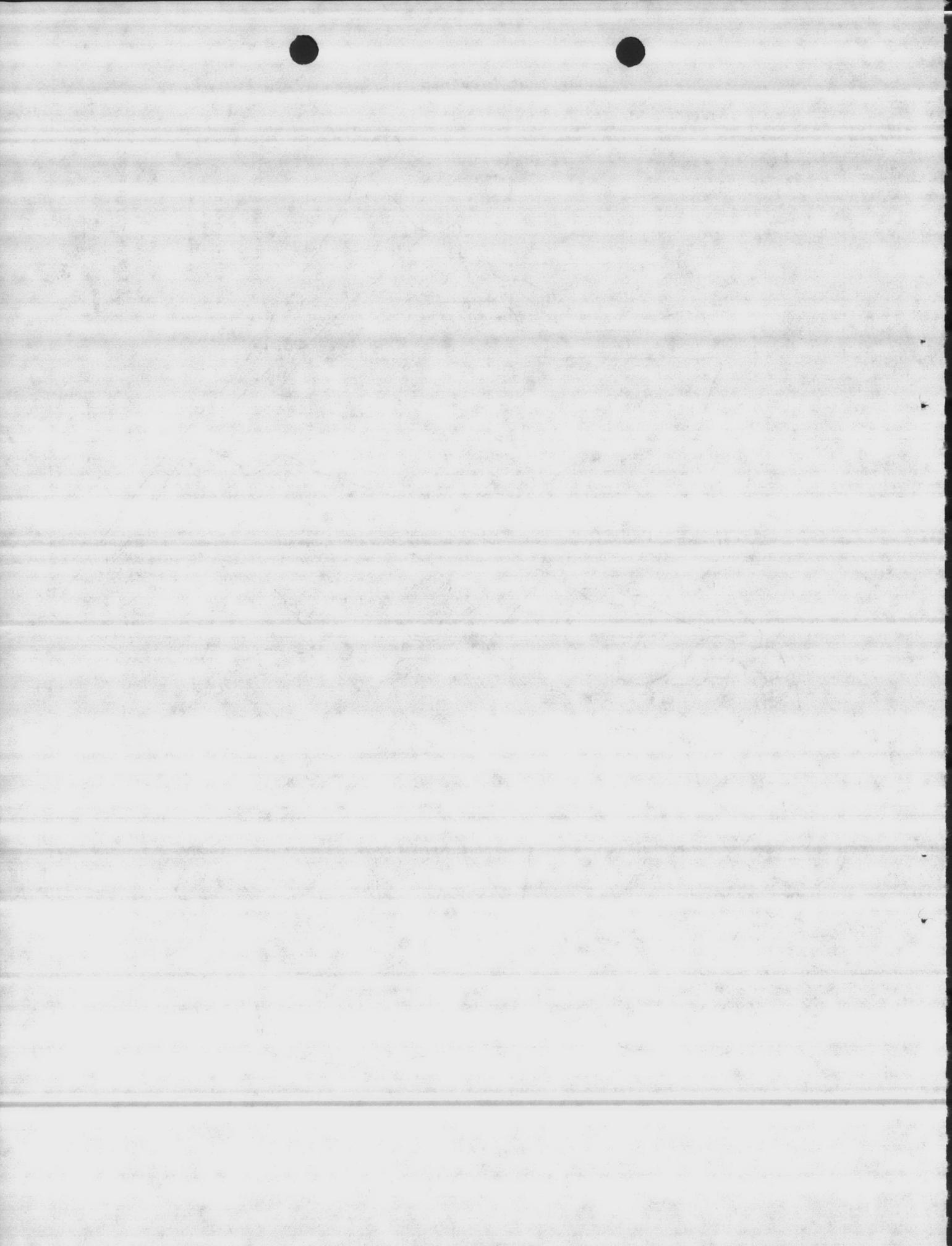
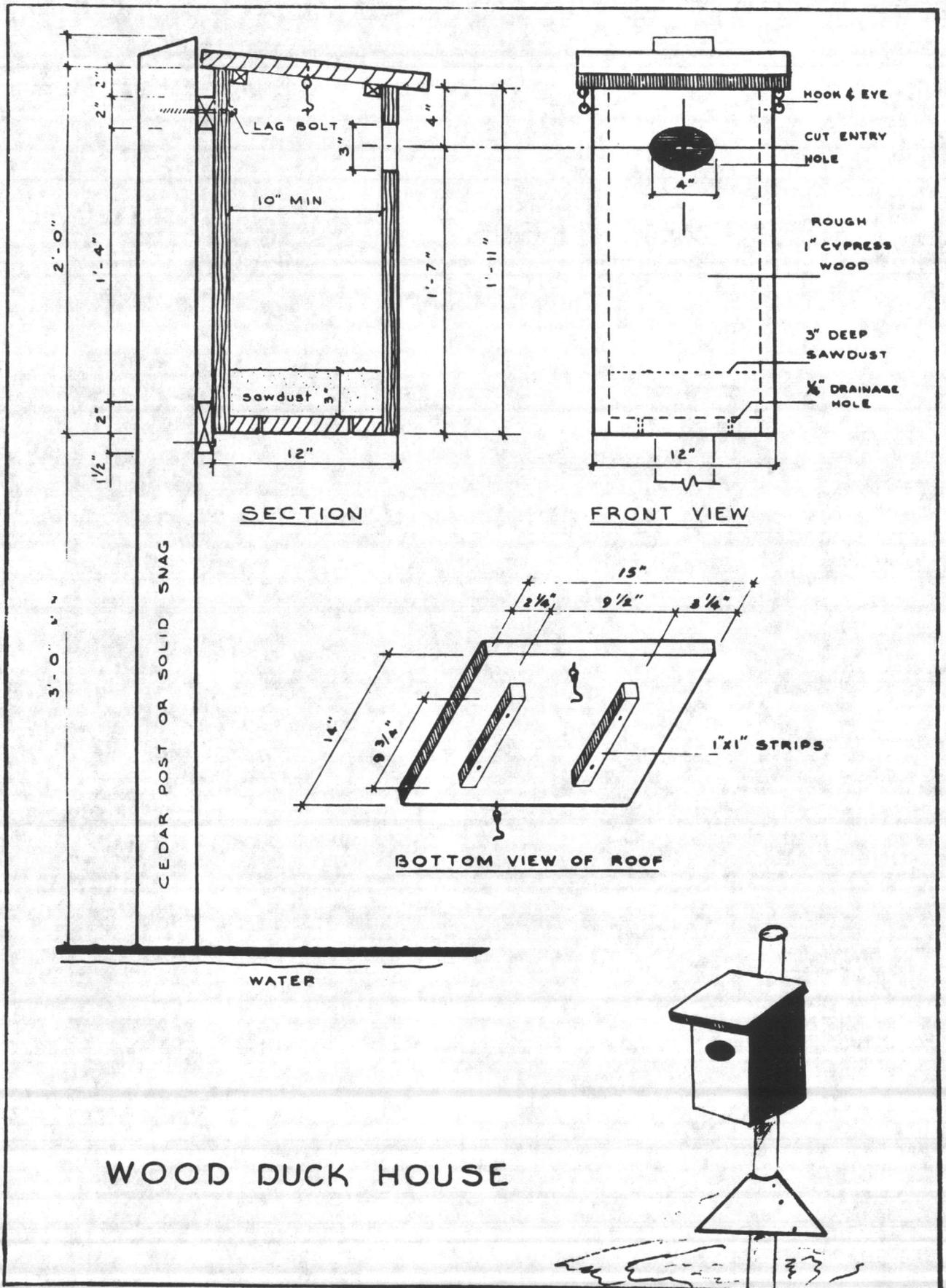


TABLE D
WOOD DUCK HOUSE PLAN



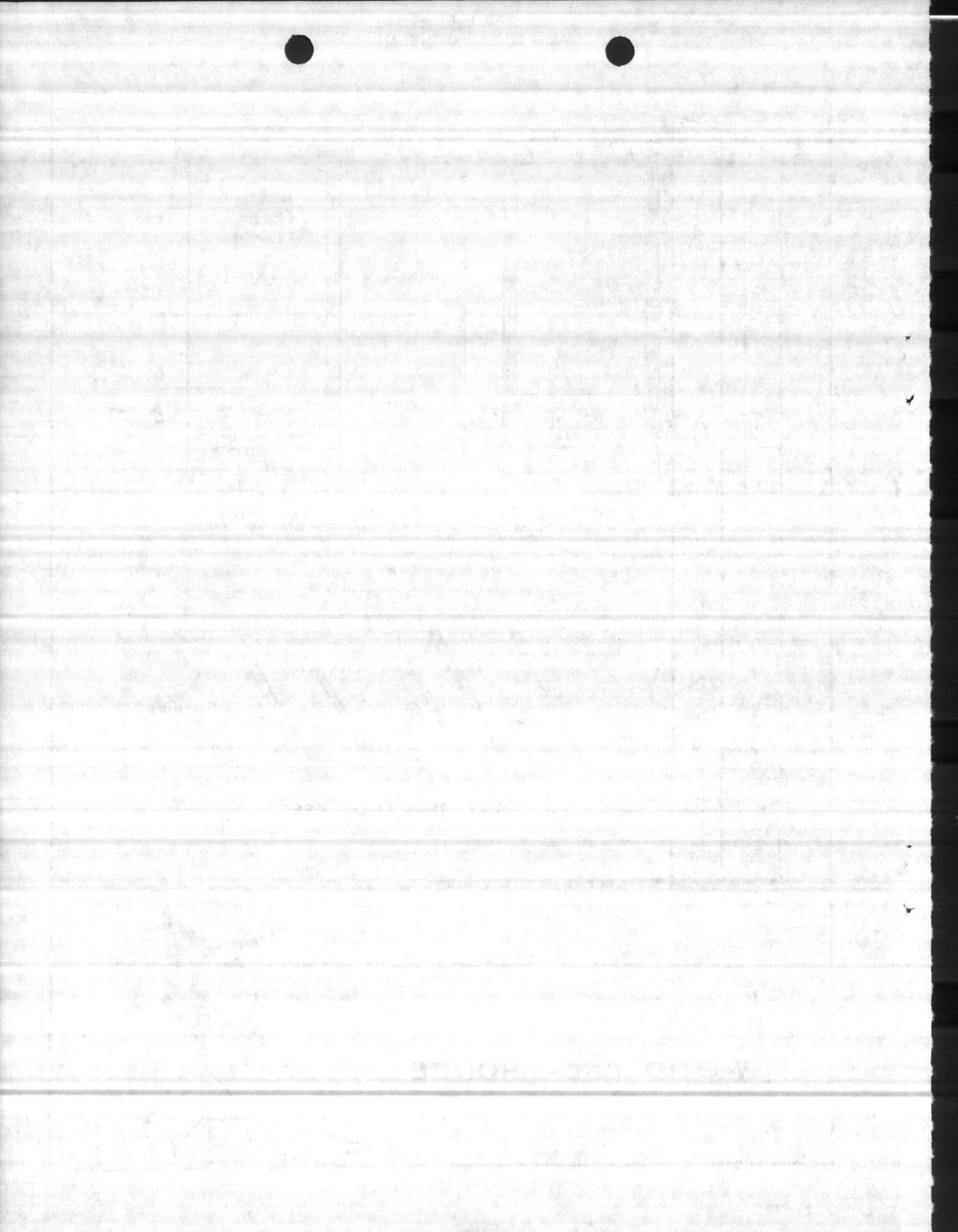


TABLE E
FERTILIZATION OF PONDS

1. General. Adequate fertilization increases the production of fresh water ponds and gives them a greater poundage of fish. Fish do not eat the fertilizer but benefit indirectly when the added fertility results in a greatly increased production of fish food organisms. A pond with excessive overflow or one which stays muddy cannot be economically fertilized, and the following benefits are realized by proper fertilization:

a. A fertilized pond will not only support more pounds of fish, but more fish can be caught. Experiments have shown that the carrying capacity of a pond is increased from four to six times by fertilization, but the harvest is usually increased eight to ten times.

b. A fertilized pond can be properly stocked. The carrying capacity of properly fertilized waters is about 400 pounds per acre whereas the carrying capacity of unfertilized waters varies from 35 to 200 pounds per acre. Because this figure is relatively constant in fertilized waters, the biologists can determine how to stock them to bring about a balanced population of fish.

c. Aquatic weeds are controlled in a fertilized pond. The color obtained in fertilized water prevents the growth of aquatic plants in water deeper than 12 to 18 inches.

d. The addition of fertilizers will clear certain types of muddy waters.

e. Mosquito control is facilitated by fertilization. In properly fertilized ponds, fish are able to control the mosquito larvae since the larvae are not protected by weeds.

2. Fertilizers

a. Experiments have proven that an 8-8-2 (a fertilizer containing 8% available nitrogen, 8% available phosphoric acid, P_2O_5 , and 2% available potash, K_2O) is suitable for ponds in this area. If an 8-8-2 is not available, the following are equivalents:

Rate of fertilization per acre for each application:

- (1) 100 pounds of 8-8-4
- (2) 100 pounds of 6-8-4 plus 20 pounds of nitrate of soda
- (3) 100 pounds of 6-8-6 plus 20 pounds of nitrate of soda
- (4) Any mixture that will give approximately 8 pounds nitrogen, 8 pounds phosphoric acid, and 2 pounds potash.
- (5) 40 pounds of 20-20-5
- (6) 50 pounds of 15-15-15

b. Organic fertilizers, such as manures, are not suitable for use in fish ponds. They are low in fertility and tend to encourage the growth of undesirable filamentous algae.

TABLE F
SUPPLEMENTAL FEEDING OF CHANNEL CATFISH

1. Basis for Supplemental Feeding. The below chart is based on 2,000 fish in a one acre pond and a food conversion of 2.0.

<u>Date of Feeding</u>	<u>No. of Fish Per Pound</u>	<u>Total Lbs of Fish</u>	<u>Pounds Food Per Day (3%)</u>	<u>Pounds Food Per Period</u>
April	12.5	159	-	-
1-15	10.4	192	5	65
16-30	8.7	231	6	78
May				
1-15	7.2	277	7	91
16-31	6.0	333	8	112
June				
1-15	5.0	398	10	130
16-30	4.2	476	12	156
July				
1-15	3.5	567	14	182
16-31	2.9	686	17	238
August				
1-15	2.4	823	21	273
16-31	2.0	998	25	350
September				
1-15	1.7	1,161	25	325
16-30	1.5	1,324	25	325
October				
1-15	1.3	1,487	25	325

2. Feeding Time

a. When surface temperature reached 60°F in the spring and until the water temperature drops below 60° in the fall.

b. 0800, six days each week.

3. Method of Feeding

a. One to three areas, approximately 400 square feet, depending upon the pond size in 3-4 feet of water.

b. Broadcast by hand the same area each time.

4. Amount

a. Feed 3% of total weight of fish in the pond.

b. Do not exceed 25 pounds of feed per acre per day regardless of the weight of the fish.

TABLE G
LONG RANGE WORK PLAN

1. Continued conservation of natural resources.
2. Development and maintenance of artificial wildlife habitats required to support the available natural resources.
3. Development and maintenance projects for the control of predators.
4. Development and supervision of plans for the harvesting of fish and wildlife species which will preclude over-population or extermination of any species.
5. Development and supervision of plans to ensure compliance with local, state, and federal laws and regulations pertaining to the conservation and harvesting of fish and wildlife.
6. Additional development of 16 wildlife food plots for large game and 15 plots for small game.
7. Continuance of fisheries management in nine fresh water ponds.
8. Anticipated construction of the Wallace Creek Dam for fish and waterfowl management.
9. Development of a green tree and a salt marsh impoundment for waterfowl.
10. Erection of nesting boxes for wood duck.



TABLE H
FY 69-70 WORK PLAN AND BUDGET

1. Development of five new wildlife food plots for large game and eight new plots for small game.
2. Continuing spring and fall development of the existing wildlife food plots.
3. Management of nine fresh water ponds for fishing.
4. Predator control measures during the months of January, February, and March.
5. Development of one green tree impoundment.
6. Erection of 25 nesting boxes for wood duck.
7. The FY 69-70 budget from nonappropriated funds of \$9,500.00 ; the estimated budget from appropriated funds of \$3,000.00.



EXHIBIT NO. 2

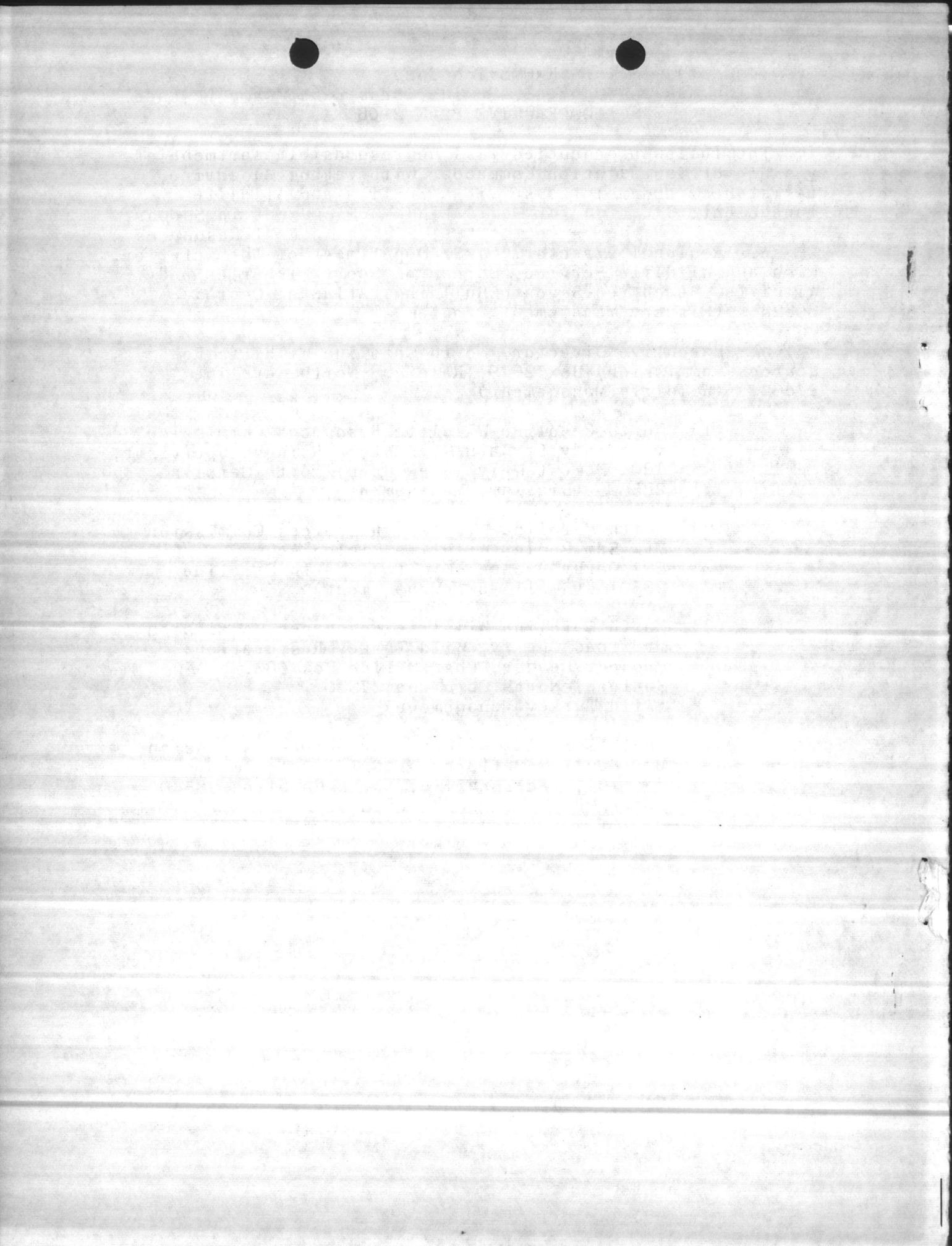
COOPERATIVE PLAN 2-69

1. The following agencies will be responsible for providing the Installation Commander with technical advice, assistance, and related services in fish and wildlife management:

a. Regional Director, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, Peachtree-Seventh Building, Atlanta, Georgia 30323. (Fishery Management Program)

b. Executive Director, North Carolina Wildlife Resources Commission, Box 2919, Raleigh, North Carolina 27602. (Wildlife Management)

- (1) North Carolina Wildlife Resources Commission
Mr. Grady L. Barnes, Eastern Refuge Supervisor,
1201 Forest Drive, New Bern, North Carolina
28560 (Big Game Management)
- (2) North Carolina Wildlife Resources Commission
Mr. Sam Poole, Wildlife Biologist
507 Darby Avenue, Kinston, North Carolina
28501 (Small Game Management)
- (3) North Carolina Wildlife Resources Commission
Mr. Thad Cherry, Wild Turkey Restoration
Project Leader, Post Office Box 683,
Sanford, North Carolina 27330
(Wild Turkey Management)
- (4) North Carolina Wildlife Resources Commission
Mr. Paul S. Metters, Wildlife Patrolman,
Box 154, Jacksonville, North Carolina 28540
(Matters of Law Enforcement)

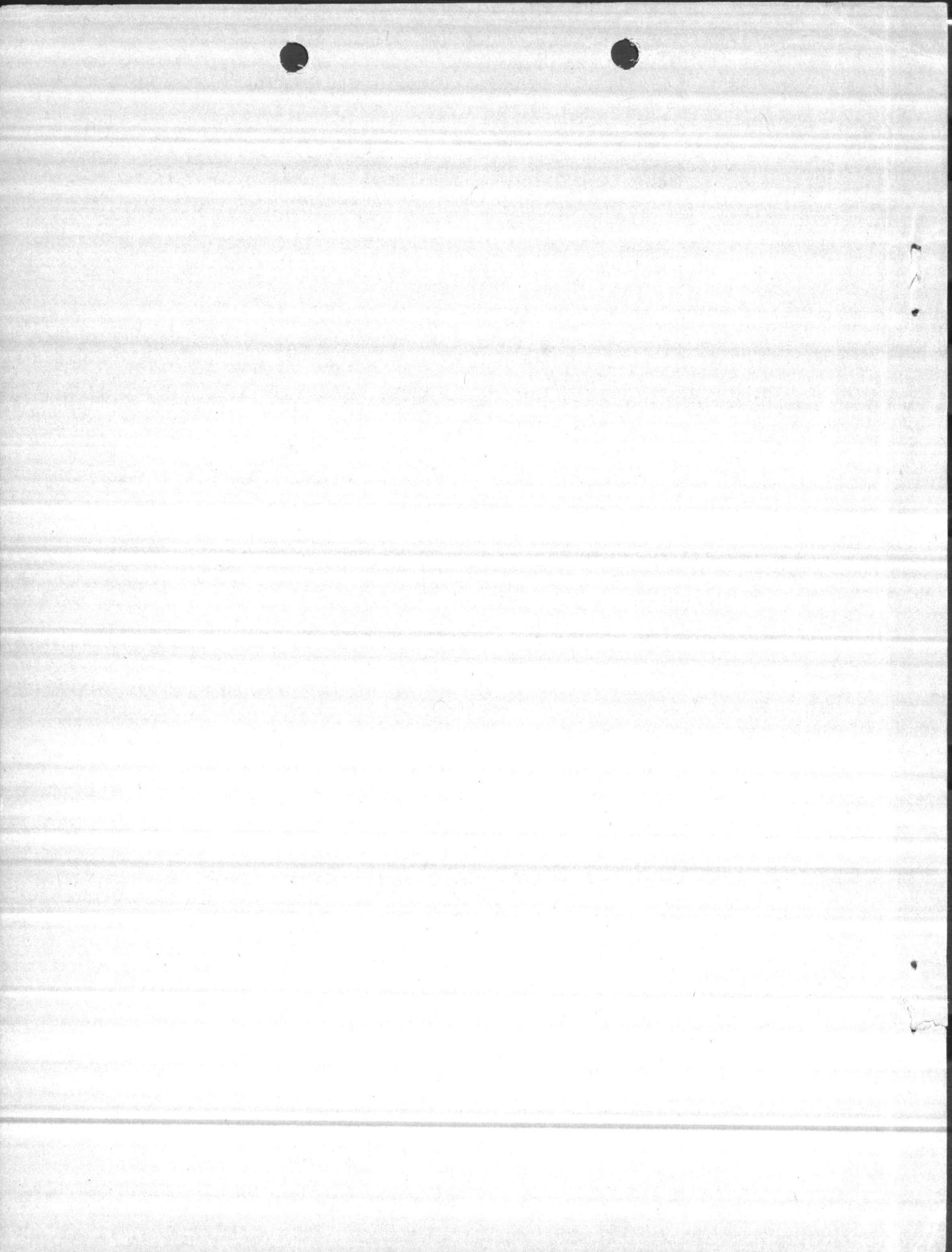


WILDLIFE MANAGEMENT PROGRAM

CAMP LEJEUNE RESERVATION

H. G. BOZARTH
LIEUTENANT COLONEL, U. S. MARINE CORPS
BASE MAINTENANCE OFFICER
CHIEF GAME PROTECTOR
FORESTRY MANAGER
AND
WILDLIFE MANAGER
U. S. MARINE CORPS BASE

CAMP LEJEUNE, NORTH CAROLINA



F-O-R-E-W-O-R-D

The Wildlife Management Program is the culmination of much study and development here in the Camp Lejeune Reservation by personnel, both military and civilian, attached to and serving with the United States Marine Corps, as well as personnel serving with the State of North Carolina Wildlife Resources Commission.

This first edition, known as the Camp Lejeune Wildlife Management Program, contains much useful information presented in an orderly, simple and attractive manner so that its presentation and contents may be readily grasped to give you a better understanding of the problems of wildlife and wildlife management.

In preparing this work we have had the cooperation of many specialists who served as authors, critics and revisers in order to bring you an up-to-date, accurate and comprehensive publication embodying simplicity of treatment, the stamp of authenticity and a logical grouping of topics. To these people, I am truly grateful.

T-A-B-L-E O-F C-O-N-T-E-N-T-S

- I. INTRODUCTION AND HISTORY
- II. WILDLIFE MANAGEMENT
- III. FOREST MANAGEMENT
- IV. FISHING MANAGEMENT
- V. CULTIVATED PLANTS
 - A. TYPES
 - B. CHARACTERISTICS
 - C. UTILIZATION AND ESTABLISHMENT OF FOOD PLOTS
- VI. NATIVE PLANTS
 - A. TYPES
 - B. CHARACTERISTICS
 - C. UTILIZATION
- VII. WILDLIFE (GAME AND NON-GAME)
 - A. TYPES, HISTORY, HABITAT, FOOD, COVER PROPAGATION AND MANAGEMENT
 - B. MAMMALS
 - C. BIRDS
 - D. REPTILES AND AMPHIBIANS
 - E. FISH
- VIII. CONTROL
 - A. LAW ENFORCEMENT
 - B. FIRE CONTROL
 - C. PREDATOR CONTROL
- IX. SUMMARY

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CHAPTER I

INTRODUCTION AND HISTORY

The United States Marine Corps Base, Camp Lejeune, North Carolina, is located on the Atlantic coast of North Carolina at approximately thirty-four degrees and thirty-seven minutes North and seventy-seven degrees and twenty minutes West (34° 37' N and 77° 20' W). This land mass encompasses the bulk of New River in Onslow County and consists of seventy-five thousand acres of land, seven thousand, seven hundred and ninety-two acres of swamp and twenty-six acres of water.

Camp Lejeune Reservation is bordered on the East by approximately fourteen miles of ocean front and contains about fifty miles of New River shore line plus innumerable miles of creek shore lines. Likewise, the Intracoastal Waterway traverses our reservation to the extent of nearly fifteen miles along the Eastern perimeter.

On the fifteenth of February 1941, a request for new ground and air bases for the United States Marine Corps was approved by the House Naval Affairs Committee, thus initiating the Marine Corps Base, Camp Lejeune, in Onslow County, North Carolina.

Prior to acquisition of this area by the Marine Corps, the locality was principally agricultural, though fishing and lumbering were secondary industries. Principal products raised were tobacco, peanuts, corn, soybeans, sweet potatoes, cotton and valuable truck crops.

Sport fishing and hunting, as well as surf bathing, was very common to this area and many resort facilities were available on the coast and shore lines.

The climate ranges from sub-tropical summers to extremely chilly winters with high humidity accompanying both heat and cold. The temperature averages 77° in summer and 45° in winter; however, extremes have been above 100° in summer and below 5° in winter. Rainfall is abundant and fairly evenly distributed, the annual precipitation being about 53.3 inches. Sub-tropical storms which are especially severe at times often sweep the entire reservation, endangering wildlife and upsetting wildlife management.

History tells us North Carolina is one of the original thirteen states of the American Union, so it is safe to assume that a great deal of this area has been under cultivation for more than two hundred years. The soil is fertile and capable of bearing heavy crops, and it is generally described as sandy loam.

CHAPTER II

WILDLIFE MANAGEMENT

The Marine Corps Base, Camp Lejeune, has since 1946 had a Wildlife Management Program in effect and there have been many beneficial results derived from this project. Results of this program have created a mounting and intensive interest by personnel of this command and we feel that it is vital and necessary to continue and perpetuate wildlife resources through scientific management development and research.

This Wildlife Management Plan is constructed as an informative and guiding instrument that can be utilized to insure a sound, sustaining natural resources conservation program to promote wildlife. The paramount plan, of course, is to promote and perpetuate wildlife, so it becomes incumbent that the interdependent facets of all our natural resources be given equal consideration and any one plan or program should not be administered so as to be a detriment to another plan, program or resource.

A good sound plan must be formulated to fulfill all the requirements of a Game Management Policy and at the same time must contribute to soil conservation, water shed protection, erosion control and good forestry principles.

The personnel who will carry out a Game Management Plan or Program in the field may not always be trained as wildlife technicians, so we have therefore given special consideration to detailed explanations on both animal and plant life as concerns this geographical location and our reservation here at Camp Lejeune.

A long term management policy should be established to insure maximum results from the efforts expended and to place wildlife productivity on a sustained yield basis. The effective period for our Wildlife Management Plan is twenty years, providing there will not be any drastic change made on the areas we now have under consideration. Food plots are constantly being developed in many areas within our reservation in order to provide year around food and cover for wildlife.

The actual field work for our program was initiated in April 1944 by the Game Protector's Section and at that time approximately four hundred and ten food plots were established. Details of this planting are described in Chapter V. Likewise, during this period, there was a program conducted to trap and dispose of predators on the reservation. This program was arranged just prior to the hunting season during the winter months and is explained in some detail further on in this edition.

During the fall and winter of 1954 and 1955 after severe hurricanes and flood waters swept through our reservation, many EMERGENCY feeders

were constructed and placed throughout our camp. Corn was placed in these feeders as a food supply for the Wild Turkeys and Squirrels. These were removed with the coming of spring.

Much experimentation was necessary for the proper establishment of the various types of wildlife food plants and many sites were selected in order to arrive at the most desirable types and most suitable locations.

CHAPTER III

FOREST MANAGEMENT

As wild game is dependent upon the forest for food and cover, so is wildlife management dependent upon forest management. There has been a Forest Management Plan in effect at Camp Lejeune since 1946. This means simply that all harvesting of timber, all silvicultural work, fire protection and control burning is done in accordance with an approved plan.

The benefits derived from a well managed forest are many fold. The primary benefit from the military point of view is to have wooded terrain of various kinds for training purposes. A burned-out wasteland would poorly serve the requirements for military training.

Secondly, a well managed forest contributes much to the national economy when it is on a sustained yield basis and from it pours a steady stream of forest products.

Thirdly, a well managed forest provides a better habitat for all forms of wildlife, so it is therefore factual that both wildlife management and forest management are closely allied.

When this locality was under agricultural management, there were farm woodlots and many large timbered areas. The timbered areas were located in inaccessible spots that could not be economically cultivated. It is here that some of our finest valuable timber stands now exist. The chief commercial trees are Yellow Pine, Oak and Gum, though many other varieties of trees abound on our reservation such as Pecan, Beech, Magnolia, Cypress, Sycamore, Holly, Chinquapin, Maple, Hickory, Mockernut, Mulberry, Sassafras, Tulip Tree, Sourwood, Buckthorn, Ash, Elm, Willow, Juniper, Cedar and many others.

CHAPTER IV

FISHING MANAGEMENT

Both fresh and salt water fishing abound on our reservation, especially in New River from Bear Inlet along the Intracoastal Waterway to New River Inlet and in more than a dozen creeks and ponds. Camp Lejeune is considered a veritable paradise for those who enjoy fishing. Game fish are stocked in fresh water streams where perch, bass, pike, blue gill and bream are plentiful. For the surf caster, Onslow Beach offers drum, blues, mullet, croakers, flounder and many others. In fact, at the time of this writing, a modern and up-to-date pier is under construction at Onslow Beach to further enhance the salt water fishing potential. Deep sea fishing is also considered to be excellent off our shore.

Wallace Creek, French Creek, Southwest Creek, Duck Creek, Gogdel's Creek and Town Creek, plus more than half a dozen ponds, are stocked for fresh water fishing.

CHAPTER V

CULTIVATED PLANTS

Cultivated plants in this area that are used for wildlife are many and varied, so we will discuss here but a few of the most common and more important. Plants not only provide food for wildlife, but equally important, they provide homes for breeding and rearing their young, escape cover from their enemies and general nesting and roosting areas. In fact, plant life provides an environment essential to the necessities of life for practically all wildlife.

Systematic planting of cultivated plants is an essential in proper wildlife management and control and is of paramount importance in order to maintain healthy wildlife in abundant quantities.

A. TYPES

- | | |
|-------------------------|---------------------|
| 1. Lespedeza Bicolor | 13. Cowpeas |
| 2. Lespedeza Sericea | 14. Multiflora Rose |
| 3. Korean Lespedeza | 15. Dwarf Cane |
| 4. Ladino Clover | 16. Quail Mix |
| 5. Alsike Clover | a. Millet |
| 6. Crimson Clover | b. Buckwheat |
| 7. Rye (Abruzzi) | c. Rape |
| 8. Orchard Grass | d. Soybeans |
| 9. Kentucky (31) Fescue | e. Cowpeas |
| 10. Corn | f. Milo Maize |
| 11. Milo Maize | g. Korean Lespedeza |
| 12. Soybeans | |

B. CHARACTERISTICS

Plants are generally classified as trees, shrubs, flowers and herbs. Most herbs are leguminous in nature and like fruit and nut bearing trees they provide, in most cases, edible food for almost all types of wildlife. Each, however, is peculiar to itself as a rule and will be characterized in detail under individual topics.

C. UTILIZATION AND ESTABLISHING FOOD PLOTS

Cultivated plant life provides not only food and cover for wildlife, but planting can be controlled to the extent whereby it will produce and afford these qualities when natural foods are unavailable or at a premium. Cultivated planting can also be used to combat erosion and return valuable

minerals and chemicals to the soil, thereby promoting and increasing our natural resources.

Cultivated planting has been undertaken at the following locations on our reservation:

<u>AREA</u>	<u>NUMBER OF PLOTS</u>	<u>NUMBER OF ACRES</u>	<u>TYPE OF PLANTING</u>
Duck Creek #1	4	5	Mixed
Duck Creek #2	1	2	Ladine Clover & Fescue
Sneads Ferry #1	3	3	Mixed
Sneads Ferry #2	4	3	Lespedeza Bicolor
Trapps Bay	6	6	Annual
Sallier's Bay #1	6	7	Annual
Sallier's Bay #2	1	2	Ladino Clover & Fescue
Onslow Beach #1	6	8	Annual
Onslow Beach #2	3	2	Lespedeza Bicolor
Freeman's Creek #1	5	6	Annual
Freeman's Creek #2	4	3	Lespedeza Bicolor
Anti-Tank Range	2	1	Lespedeza Bicolor
Triangle Outpost #1	3	3	Annual
Triangle Outpost #2	4	2.5	Lespedeza Bicolor
Triangle Outpost #3	1	2	Ladino Clover & Fescue
Bear Creek and Highway 172	3	6	Annual
Highway 172 and Starling #1	4	4.5	Annual
Highway 172 and Starling #2	3	4	Lespedeza Bicolor
Duck Creek to Starling	35	92	Game Food
Bench Field to Stone Street	4	3	Lespedeza Bicolor
Sawmill Area	1	2	Ladino Clover & Fescue

In addition to the plots listed in the preceding paragraph, we are experimenting with five acres of Ladino Clover and Kentucky (31) Fescue at various other locations throughout the reservation.

This year we hope to have an extensive winter green food program established following the regular hunting season. These winter green plots are designed to supplement the natural food of the Wild Turkey primarily; however, Rabbits, Deer and even Quail to some extent will augment their food requirements with this invaluable green food.

Work accomplished so far has incorporated both annual and perennial plantings, with perennial planting usually placed adjacent to annual planting. The annuals are only good for one year, although as a rule they will furnish a little food for the second year. There is enough "second year" annual food left to allow time for the perennial plant to mature and produce seed.

The objective from the start of our program has been to establish permanent food plantings throughout the reservation and to gradually reduce the annual planting. We feel this method to be the most sound overall approach to wildlife food production because perennial planting will ultimately provide wildlife essentials the year around.

LESPEDEZA BICOLOR - Lespedeza Bicolor was introduced in the United States from Japan because of its value as an ornamental. More recently, the United States Soil Conservation Service tested the plant for erosion control qualities and as a source of food for the Bob White Quail. In the last twenty years, several million seedlings have been distributed by various game departments in the Southeastern United States. The North Carolina Wildlife Resources Commission has distributed several thousand Lespedeza Bicolor seedlings to the Marine Corps Base here at Camp Lejeune.

Lespedeza Bicolor is a bushy shrub attaining a height of six to eight feet on moderately fertile soil. It is a heavy seed producer and the green and brown mottled seeds are available until late winter. The seed is produced the first year from planted seedlings, it is shade tolerant and will grow on most soils except those poorly drained. This plant also helps control erosion, grows much better than native vegetation here on our reservation and it can be planted in cut-over woodland, along woodland borders and on other marginal land instead of taking up valuable crop land space.

As soon as Lespedeza Bicolor seedlings are received, remove them and plant. Seedlings that cannot be planted within a day or two after being received should be heeled-in by placing them in a shallow trench and covering the roots with moist soil. We here at Camp Lejeune have found that best results are obtained if the seed beds or planting sites are prepared in advance of the planting date. It is recommended also, prior to planting, that fertilizer (0-12-12) be worked into the soil at the rate of about four to eight hundred pounds per acre. Remember, Lespedeza is a legume and produces its own nitrogen.

Experience here at Camp Lejeune has taught us that it is best to plant Lespedeza Bicolor in rows two to three feet apart and with plants set at intervals of two to three feet in the row. It is most effective also when planted in strips four to six hundred feet long and ten to fifteen feet wide. One such strip, incidentally, will normally take about one thousand seedlings and will produce ample food and cover for wintering a covey of Quail.

Lespedeza Bicolor will produce seeds year after year with occasional side dressings of fertilizer (0-12-12). Mowing or disking every third or fourth year is recommended.

Here on Camp Lejeune Reservation, we prefer seedling lespedeza for good, hardy and rapid growth; however, planting of seed is found very useful and satisfactory, especially on woodland border strips and small plots. For row planting, it is recommended to plant in shallow furrows two to three feet apart using approximately fifteen seeds per foot. When broadcasting, use at the rate of approximately ten pounds to the acre, but keep your plots relatively small (not over an eighth of an acre) and cover seed to a depth of not more than one-fourth to one-half inch. Furthermore, plant only when ground is moist and all danger of frost is over. Remember the fertilizer 0-12-12.

LESPEDAZA SERICEA - Lespedeza Sericea was first introduced in the United States from Asia and since about 1896, it has been a very important hay crop in the Southeast. Likewise, it has been used extensively in this country as an erosion control plant. It is deep rooted, somewhat bushy, bears greenish and yellow flowers, produces an abundance of seed and attains a height of about three feet. It prefers well drained clay loam or heavy silt loam soil and withstands droughts perhaps better than any other type of Lespedeza. It is easily planted and maintained, makes an excellent escape cover for Quail and other small game, as well as an area for roosting and nesting. Lespedeza Sericea is even more effective as such when planted alongside of Lespedeza Bicolor.

Lespedeza Sericea should be planted in a firm, well prepared seed bed about five to fifteen feet in width and four to eight hundred feet in length. The seed bed should be prepared well in advance of the planting and fertilized with 0-12-12 fertilizer at the same rate as for Lespedeza Bicolor. Seed should be broadcast at a rate of fifteen to twenty pounds per acre. Plots should also be plainly posted and protected from troops.

KOREAN LESPEDAZA - Korean Lespedeza is an annual with a very low form and offers little, if any, cover for wildlife. Its chief value, however, is in the seed produced and it should be encouraged whenever and wherever possible. We have considerable growth of this legume on our reservation. It is noticeable in several fields and especially along road shoulders. This lespedeza is easily killed by frost but will re-seed itself annually to a great extent.

We consider this to be one of the most important domesticated Quail and Rabbit foods, but its low form is a disadvantage over the taller lespedezas because it is easily covered by heavy snow and often trampled upon.

Korean Lespedeza should be planted, fertilized and cultivated at approximately the same rate and formula as Lespedeza Sericea.

LADINO CLOVER - Ladino Clover is a small leguminous plant, very common to the United States, used as both an erosion control agent for lawns and pastures and as a winter green which is an important supplement to wildlife food.

Plots to be planted should be thoroughly disked and limed with an agricultural lime at the rate of five to eight hundred pounds per acre. Fertilizer (either 2-12-12 or 0-14-14) should be applied at the same time at a rate of about five hundred pounds per acre. The seeding rate should be approximately four to eight pounds per acre. It has been a general practice here at Camp Lejeune to sow some other winter green as an admixture with Ladino Clover. We have used both Kentucky (31) Fescue and Orchard Grass very successfully. The seeding rate for this is approximately one-half pound Ladino with four to eight pounds of Kentucky Fescue or Orchard Grass per acre. The leaves and seed will furnish food for Quail, Wild Turkeys and nearly all types of song birds and the foliage will be utilized by rabbits and deer. Spring and fall plantings may be used, but we here at Camp Lejeune prefer the fall planting.

ALISKE CLOVER AND CRIMSON CLOVER - Aliske Clover, like Crimson Clover, is a perennial type legume that attains a maximum height of about one foot. In 1947 we experimented with this type of clover and found it unsatisfactory due to several reasons. Aside from it being rather short-lived, it comes up rather late and our hot summer weather tends to kill it off.

RYE (ABRUZZI) - Rye (Abruzzi) has been used here as a nurse crop for winter green plots with some degree of success, the sole purpose being to nurture Ladino Clover, Kentucky Fescue or Orchard Grass until these plants become established. When the Rye becomes too thick, it is necessary to cut it back to allow the Clover, Fescue or Orchard Grass to take over the plot. This Rye is adapted to well drained soil and it will thrive on poor soil.

The planting site should be plowed, disked and well fertilized for the best results, using a 2-12-12 fertilizer at a rate of about five hundred pounds per acre. Seeding can be accomplished either by sowing by hand or by broadcasting at the rate of about one-half bushel per acre.

ORCHARD GRASS - Orchard Grass is utilized here on our reservation as a winter green planting, either by itself or as an admixture with clover as previously explained. Sometimes it is mixed with Kentucky (31) Fescue also. It succeeds best on heavy moist soils when fertilized with 0-14-14 fertilizer at the rate of five to six hundred pounds per acre.

Seeding and planting should be done on a well prepared site using from two to eight pounds of seed per acre, either in the spring or fall, with the fall planting preferred.

KENTUCKY (31) FESCUE - This grass is a valuable source of food for many kinds of wildlife and it is utilized by itself or as an admixture with other grasses, clover and with many other legumes. Like Orchard Grass, we use it as a winter green and have found it to be quite successful, in fact it will grow in a variety of situations.

Seeding and planting should be done on a well prepared site which has been fertilized with a 2-12-12 fertilizer. Seed can be broadcast by hand, or mechanically, at the rate of about one-half bushel per acre. We are using this at many locations along with Ladino Clover.

CORN - Corn is perhaps the most valuable and important wildlife food. It will sustain practically all wildlife and is preferred, in fact, by most animals and fowl. Yellow corn is recommended by far over white corn due to its extremely high vitamin "A" content and is used almost exclusively in our Game Management Program at Camp Lejeune. Corn will thrive on almost any type of well drained soil; however, the best yields require high fertility.

Corn should be planted every year and cultivation should start in this area around the first of April and no later than the first of June. When cultivating, the soil should be disked thoroughly and rows made from two to three feet apart. Shallow cultivation is preferable because deep cultivation tends to yield a very poor crop. At the time of cultivation the plot should be well fertilized, using either a commercial fertilizer (2-12-12) or manure. Fertilizer should be used at a rate of about four to nine hundred pounds per acre and manure at a rate of ten tons per acre.

An excellent use for corn is to plant it along with other annual food plots, a few rows along the margin of the plots is ideal. Stalks may be left standing during the winter months as an outline aid. Also during the winter months, it is desirable to harvest the corn in "shocks" (which is to erect corn stalks so as to form a tripod). As such, it affords not only food for wildlife but cover and protection as well. Corn may even be broadcast in food plots with excellent results; however, it seldom reaches maturity due to browsing and grazing animals eating the choice green stalks.

MILO MAIZE - Milo Maize is an annual that is managed in about the same manner as corn with approximately the same soil and fertilizer requirements.

SOYBEANS - The Soybean is a legume that is considered to be a very good food from the standpoint of the Game Management Program. Soybeans will grow on a variety of soils and can prosper even though drainage is quite imperfect; however, seed must be inoculated prior to sowing and fertilizer (0-14-7 or 0-14-14) should be used at a rate of three to four hundred pounds per acre for the best yields.

We feel that it is worthwhile to inter-plant with other crops, especially corn, and this should be done at the rate of about one gallon of seed to the acre. When sowing seed alone, we recommend about one-and-one-half to two bushels per acre for best results.

COWPEAS - Cowpeas, like the Soybean, is a legume and considered to have much the same qualities and usefulness. Both are used as green manure (when plowed under and allowed to decay, they will increase the yield of succeeding crops since they add nitrogen to the soil). We have observed also that Rabbits and Deer make good use of the foliage and vines.

MULTIFLORA ROSE - Multiflora Rose is used primarily as a retreat and escape cover for quail, rabbits, song birds and other small game. However, on our reservation we have not needed to use this plant since we have sufficient cover to conceal our game species.

DWARF CANE - Cane is the name applied to various plants which have reed-like stalks or stems, although it is actually a member of the grass family. Dwarf cane grows well here on our reservation and it is not only a valuable source of food for wildlife but it provides cover and nesting materials as well for birds and small animals.

QUAIL-MIXTURE - Quail mixture consists of the following Plants - Millet, Buckwheat, Rape, Milo Maize, Soybeans, Cowpeas and Korean Lespedeza. Planting sites should be prepared in advance with fertilizer (2-12-12) applied at a rate of three to five hundred pounds per acre. The mixed seed can then be distributed in either the conventional manner or as described for all other seeds mentioned at the rate of twenty-five pounds per acre. Seeding can be accomplished from May 15 to July 15.

The principal purpose of these plantings is to supply food until the perennials are ready to produce seed. The same plots should not be plowed and planted every year, but alternated insofar as possible so as to provide cover and food on the previous years plots.

It must be understood that the aforementioned plants are only a fractional part of the many cultivated types used by wildlife in this area. By no means have we covered all of them. Suffice it to say that those mentioned have been ascertained to have good material worth on our reservation and are deemed most satisfactory.

CHAPTER VI

NATIVE PLANTS

Native plants in this area that are useful to wildlife are even more numerous than cultivated ones, so we will make no attempt to enumerate all of them. We will, however, discuss the most common and most important. As with cultivated plants, the native types provide food, shelter, nesting areas, roosting areas, escape retreats and areas for breeding and rearing off-spring

Systematic thinning, replanting and reforestation are essential to keep our native wildlife habitat suitable to maintain wildlife abundance in certain areas, but in other areas management has little, if any, requirement to assist nature.

Prior to acquisition of this area by the United States Marine Corps, the locality was primarily under agricultural management and there were many farm wood lots and large timbered areas. The timbered areas were located more or less in inaccessible areas that could not be cultivated and it is here that some of our most valuable hardwood and coniferous stands now exist. Likewise, in these areas we have some of the best habitats for our wildlife. A great deal of the first growth timber has been logged off since our acquisition and much of the second growth is being thinned as an aid toward improvement of the timber land. Also, since government acquisition much of the agricultural land has reverted to native plants and trees, thereby providing excellent habitat for wildlife.

Native plants will be broken down into two categories for the sake of simplicity in description, characteristics and utilization. Category one, Trees; category two, Shrubs, Vines and Herbs. Trees are further divided into two separate sub-groups, Conifers and Deciduous.

A. TYPES

TREES

1. Ash
2. Beech
3. Cedar
4. Cypress
5. Dogwood
6. Elm
7. Gum
8. Hickory
9. Holly
10. Pine
11. Maple
12. Oak
13. Persimmon
14. Sassafras
15. Sourwood
16. Sweetgum
17. Sycamore
18. Tulip Tree
19. Walnut
20. Wild Cherry

SHRUBS, VINES AND HERBS

1. Beggarweed
2. Greenbriers
3. Native Lespedeza
4. Partridge Peas
5. Ragweed
6. Wild Huckleberries
7. Wild Grapes
8. Wild Vetch
9. Wild Honeysuckle
10. Wild Air Plants

B. CHARACTERISTICS

Plants are generally classified as trees, shrubs, flowers and herbs. Trees are the most conspicuous and best known plants and are easily identifiable by their leaves. A tree is a woody plant with a single erect stem, growing to a height of ten feet or more. While shrubs are also woody, they are usually smaller than trees and tend to have more stems growing in a clump. Herbs have a low form lying close to and generally covering the ground. Vines, of course, trail along the ground, climbing and clinging to shrubs and trees with their tendrils. Both herbs and vines afford not only excellent food for wildlife but shelter as well.

C. UTILIZATION

ASH - White Ash and Red Ash are fairly common to our area and they are found growing in rich moist soil with Hickory, Oak and Maple. Fruits are single keys with long narrow wings. Leaves are dark green above, paler and silvery underneath, each with a few irregular blunt teeth and they turn yellow or purple in autumn. Broadleaf, deciduous, height 40 to 90 feet, Olive family.

BEECH - Beech is quite common here. It prefers rich bottomland or upland soil and tolerates shade well. Its distinctive smooth gray bark, long point buds and strongly veined leaves are characteristic. The fruit, a triangular nut, is eaten by many animals and birds. Broadleaf, deciduous, height 60 to 80 feet, Beech family.

CEDAR - Few Cedars grow on our reservation, but they are an important tree for wildlife. The leaves are sharp and needlelike, the fruit a bluish berry. Conifer, evergreen, height 20 to 60 feet, Pine family.

CYPRESS - Bald Cypress, as it is commonly known here, abounds in our swamps; however, in years past the population has been sadly depleted. It is recognized as a conifer although it sheds its thin, flattened leaves in winter. It has small, rounded cones which form in the late summer, are gray to brown with thin and shaggy bark. Conical or flattened "knees" grow up from the roots allowing the tree to breathe and these are very likely to be tripped over when walking through the swamps. Height 80 to 150 feet, deciduous, Pine family.

DOGWOOD - Dogwood trees are a valuable source of food for wildlife, bearing attractive flowers and red berries with oppositely placed simple leaves with curved, almost parallel veins. Broadleaf, deciduous, height 10 to 60 feet, Dogwood family.

ELM - The Elm tree, and a close relative called the Hackberry tree, is a conspicuous tree with spreading, open branches and is easily identifiable by its vase-like form. Although it is menaced here by insect pests a great deal, it has valuable food and shelter properties for wildlife. Broadleaf, deciduous, height 10 to 100 feet, Elm family.

GUM - Many varieties of Gum trees are found here, some of which are called Black Gum, Sour Gum and Tupelo. It is a medium sized tree peculiar to moist and swamp-like areas with smooth shiny leaves turning brilliant red in the fall. The dark blue fruit of the Black Gum and red fruit of the Sour Gum and Tupelo are a valuable food for birds, opossum and raccoon. Broadleaf, deciduous, height 50 to 75 feet, Dogwood family.

HICKORY - A few Hickory trees can be found in this locality, but a relative called the Mockernut is more common to our area. The leaves are alternate and compound with five or seven rather broad toothed leaflets. The nuts have thick husks and shells with some meat inside. The Mockernut does not contain as much meat as the Hickory nut, although both are valuable foods for squirrels. Broadleaf, deciduous, height 40 to 80 feet, Walnut family.

HOLLY - Holly reaches real good growth here in moist soil and swamps. It is recognized by its heavy, spiny, evergreen leaves and its smooth gray bark. Male and female flowers are borne on separate trees and the bright red fruits only on the female tree. This fruit is an excellent winter and early spring food for birds and small animals. Broadleaf, evergreen, height 20 to 50 feet, Holly family.

MAPLE - Next to Oaks, the Maples are the best known broadleaf trees. They all have palm-shaped, simple, opposite leaves and typically paired winged fruit. Birds, squirrels and other small mammals are especially fond of this fruit. Red Maple is our common variety, although not heavily populated here. As the leaves unfold, they are reddish, gradually turning to green, paler underneath with triangular lobes and red teeth. Broadleaf, deciduous, height 60 to 80 feet, Maple family.

OAK - The Oaks rank with the world's most important trees and certainly are one of the largest groups of trees in the United States. All Oaks have the distinctive fruit - acorns. The Oaks most common to the Camp Lejeune reservation are White Oaks, Red Oaks, Black Oaks, Turkey Oaks, Chinquapin Oaks, Post Oaks, Black Jack Oaks, Willow Oaks, Overcup Oaks, Water Oaks and Swamp Oaks. Oaks have alternate simple leaves, some entire and others toothed or lobed. Some Oaks are hard to identify, but acorns and bark are the best guides. Oaks are a very

important source of food for many kinds of wildlife and in years when the mast crop (acorns) fails, the deer, squirrels and raccoons would have trouble finding enough to eat were it not for our Wildlife Management Program. Broadleaf, deciduous, height 20 to 90 feet, Beech family.

PERSIMMON - Persimmon trees are rare on our reservation, but nevertheless, they do exist and should be mentioned because of their edible fruit popular with raccoons, opossums and foxes. In the fall, the glossy green leaves become tinged with yellow. The trees are laden with dull orange fruits, but like the Holly, only the female trees bear. Broadleaf, deciduous, height 20 to 60 feet, Ebony family.

PINE - Pines are classified as conifers and nearly all are evergreen, lacking true flowers. Our reservation has Long Leaf Pine and Loblolly Pine. Long Leaf Pine has, as its name applies, long needles--12 to 18 inches long, dark green and shiny, three in a cluster. The bark is orange brown and scaly and the cones are 5 to 10 inches long. Loblolly has long needles in threes like other yellow pines. Cones are narrow, 4 inches long, persistent, with small spikes on scales. The bark is grayish and deeply furrowed. Loblolly is a fast growing tree tolerant to poor and sandy soil. Conifer, evergreen, height 46 to 120 feet, Pine family.

SASSAFRAS - Sassafras trees are quite common on our reservation and are easily identified by their peculiar, mitten-shaped, three-lobed leaves and aromatic twigs. Birds, including quail, are fond of the purple fruit. Broadleaf, deciduous, height 25 to 50 feet, Laurel family.

SOURWOOD - Sourwood has simple, alternate, shiny dark green leaves turning a rich scarlet with the coming of cold weather. The fruit is a small hairy capsule with many seeds, favorite of song birds and woodpeckers. Deer are especially fond of the sprouts and young shoots and the bees make delicious honey from the flowers. Broadleaf, deciduous, height 15 to 40 feet, Heath family.

SWEET GUM - Despite its name, Sweet Gum is not related to any of the Dogwood family gums as previously described. Sweet Gum is a tall, straight tree of low moist places with star shaped leaves somewhat like the Maple, but growing on alternate twigs. The hanging dry fruit, a ball covered by tiny horns, opens to release small winged seeds which are eaten by birds and squirrels. The bark is thick gray and scaly. Broadleaf, deciduous, height 80 to 120 feet, Witchhazel family.

SYCAMORE - American Sycamore is rare on our reservation. The leaves are almost heart shaped, three to five lobed, thick, light green above, paler and hairy below. The base leaf stock is hollow concealing the winter bud. Fruits are typical "buttonballs" and the seeds are eaten by birds and small animals. Broadleaf, deciduous, height 80 to 100 feet, Plane family.

TULIP TREE - Commonly called Yellow Poplar, the Tulip Tree is a prolific grower with a straight trunk, full of branches. The bark is thick, grayish, ridged. The fruit is a cone full of many small winged seeds eaten by song birds and quail. Broadleaf, deciduous, height 80 to 120 feet, Magnolia family.

WALNUT - Walnut has large, fragrant leaves. Leaves have fifteen or more leaflets, each finely toothed and ending in a fine point. They are smooth above and hairy below. The nuts grow in thick green husks and are eaten by squirrels and other wildlife rodents. Broadleaf, deciduous, height 80 to 100 feet, Walnut family.

WILD CHERRY - There are several types of Wild Cherry trees, which of course, are easily identified by the fruit. Leaves are thick, narrow, tapering and shiny green. Twigs are thin with slender brown buds. Flowers give way to fruit, eaten avidly by birds and small mammals, even bears. Cherry trees grow in moist soils and are close relatives of plums. Broadleaf, deciduous, height 10 to 40 feet, Rose family.

BEGGARWEED - (*Dosomodium Durpureum*) - Beggarweed is a perennial that attains a height of two to four feet and has blue or purple flowers similar to the Lespedeza Bicolor flower. These weeds are very prolific in this area and are a valuable plant for wildlife.

GREENBRIERS - There are many and varied species of these woody and usually thorny vines. Some are deciduous by nature and some are evergreen. All are extremely valuable to wildlife, providing both food and cover, but most are considered a pest by the average layman. Greenbriers should be encouraged wherever possible.

NATIVE LESPEDEZAS - This native legume is one of the most important sources of winter food for the Bobwhite Quail and is quite abundant here on our reservation. The native Lespedeza has about all the same qualities and characteristics as the Korean Lespedeza described earlier under Chapter V, Cultivated Plants.

PARTRIDGE PEA - Partridge Peas are two types here on our reservation; namely, the showy type and the sensitive type. Both are plants that readily migrate into waste areas where the soil has been exposed, such as road shoulders, field borders or eroded areas. We here at Camp Lejeune take advantage of this characteristic by simply lightly disking a field, thereby allowing the Partridge Pea to seed in naturally and become established. The showy type Partridge Pea is an erect spreading annual, one to three feet high, with yellow flowers and compound leaves of the pinnated type similar to the Black Locust. The other Partridge Pea, called the sensitive type, is smaller, usually growing to about two feet in height and the leaves are very sensitive to the touch, folding or closing when contacted.

RAGWEED - The Ragweed we mention here is the dwarf type and is of great importance as a winter quail food. It can usually be found in broken soil along with other grain crops, most commonly found in fallow fields and along roadsides.

WILD HUCKLEBERRIES - Many wild berries thrive on our reservation and nearly all provide an abundant source of food and cover for our wildlife. Especially important are Huckleberries (sometimes called Whortleberry or Blueberry). This is a shrub belonging to the Heath family of which there are several species here at Camp Lejeune. They have bell-shaped flowers, small oval or wedge-shaped leaves and sweet juicy berries which are a wildlife delicacy.

WILD GRAPE - The grape is a climbing plant and clings to every available support by means of tendrils. They have been known to climb trees thirty to forty feet high but are best known for their spreading tendencies. The food and cover is excellent for many kinds of wild game. Birds and bears alike are very fond of grapes as a supplement to their diet.

WILD HONEYSUCKLE - A family of twining plants which bear trumpet-shaped, nectar-filled flowers and abounds here on our reservation. These plants not only attract bees and hummingbirds, but birds including quail and turkey eat the berries and take advantage of their excellent cover. Honeysuckles grow along waysides or in tangled woodland. Most of them are evergreen, thereby providing year around cover for our wildlife.

WILD VETCH - Vetch, the common name of a genus of leguminous, or pod bearing, plants used for green manure and pasturage is quite common at Camp Lejeune. The vetches are plants of a trailing habit and provide excellent food and cover for quail and small animals. Vetch grows best in the cooler seasons and will be found inter-mingled with reed-like grasses and greenbriers which tend to keep the trailing vines of vetch off the ground.

WILD AIR PLANTS - We have many Wild Air Plants here and they are worthy of mention in that they are useful to our wildlife when it comes to nesting, roosting and escaping from their enemies. They also provide a source of water, if necessary. Extremely common is the Spanish Moss. Air plants, or Epiphytes, grow attached to or perched on trees, poles or even wires where they may be able to get more sunshine or rain.

CHAPTER VII

WILDLIFE -- GAME AND NON-GAME

Wildlife here at Camp Lejeune is an easy crop to grow because it is a natural product of the land and will produce abundantly if given half a chance. Cultivated plants and native plants as mentioned in the preceding chapters materially aid wildlife, both birds and animals seem never to forget places where food is abundant and the supply dependable. We will divide the wildlife into four categories-- Animals, Birds, Reptiles and Amphibians, and Fish.

Some of the most common types of wildlife indigenous to our reservation are as outlined below:

A. TYPES, HISTORY, HABITAT, FOOD, COVER PROPAGATION AND MANAGEMENT

<u>MAMMALS</u>	<u>BIRDS</u>	<u>REPTILES AND AMPHIBIANS</u>	<u>FISH</u>
Bear	Dove		Bass
Deer	Quail	Alligators	Bream
Fox	Turkey	Frogs	Blue Gill
Raccoon	Woodcock	Turtles	Perch
Rabbit	Migratory Water Fowl	Snakes	Pike
Squirrel	Blue Jay		Robbin
Bobcat	Starling		Trout
Mink	Cardinal		Flounder
Muskrat	Owl		
Opossum	Hawk		
Otter	Gull		
Skunk			

B. MAMMALS

DEER - The white-tailed or Virginia Deer (*Odocoileus Virginianus*) is common to our reservation and is one of the best known and most admired game animals. White-tailed Deer are reddish brown, becoming more gray in winter. The fawns, born in the spring, remain spotted with white for four or five months as a rule. Bucks are about five feet long, three feet high at shoulders and they sometimes weigh over two hundred pounds. Does are smaller. Both male and female have tails about one foot long with white underneath and these are raised like white flags when deer are in flight.

Our present deer population is estimated to be between twenty-five hundred and three thousand, equally distributed throughout the reservation and the legal kill is estimated to be about ten percent of the total population.

Early colonial reports show that deer were once abundant in most parts of North Carolina; however, intensive agricultural developments caused them to become more and more scarce in many sections, until by 1850 they were largely confined to the Western mountains and Eastern plains. By 1900 nearly all the deer had been killed out in the Western part of the state but the Eastern deer remained firmly rooted here because of the protection of extensive impenetrable swamplands.

October and November are the peak months here of the breeding season. The gestation period is normally from two hundred to two hundred and ten days and one or sometimes two young are produced per doe. The sex ratio at birth is just about fifty-fifty. Most fawns are dropped in May, although some are born in June. A new born fawn weighs from five to ten pounds at birth, is light brown in color with white spots. These spots remain until the first molt in the fall of their first year. Does are normally first bred in the second fall of their life. The Buck becomes mature about eighteen months of age when they grow their first set of antlers. It takes about five months to grow a full rack of horns which first appear as soft, spongy nubbins about May and continue to grow until September. With the advent of cold weather, the velvet is removed from the surface by rubbing against trees and shrubs. Upon completion of the rubbing season, the horns are dropped, usually in January. A new set of antlers is grown every year. The number of points on a set of antlers bears no relationship to the age of the buck, although spike horns are most frequent on one and one-half year old bucks. Many deer grow four or more points the first year they have horns. The size and development of the antlers is more an indication of food conditions and the general vigor of the animal rather than an indication of age.

Deer usually live to be about twelve years of age; however, there are records indicating that they sometimes live to more than twenty years under protected conditions. It normally takes from four to six years for a deer to attain its maximum growth.

When bucks only are harvested over a long period of time there is a tendency to kill off the larger deer, which of course results in a belief that the deer are getting smaller and smaller. This is not actually true--it simply causes the remaining buck population to be composed mostly of younger deer that have not had a chance to attain full growth. It is our intention to alternate certain hunting areas in order to allow the animals a better chance to attain their full growth.

Deer feed on leaves and twigs of trees, shrubs and vines; fruits and acorns when available and some grasses. Cover is vital and

necessary not only because of natural enemies, but to provide homes for breeding and rearing their offspring. The forests also provide protection from poaching and the rivers, creeks and lakes provide protection from running dogs.

BEAR - Bears are quite common here although they confine themselves primarily to rather dense vegetation and are not often seen. The Black Bear, despite its name, vary from black to brown in color and sometimes have a little white on its chest. Bears feed on small mammals, fish, plants and especially wild berries and grapes. The young (usually two) are born in the late winter while the mother is dormant and remain with her until the following fall when they each seek a den under a fallen log or heavy brush for the following winter. Their length is about six feet, height three feet and weight up to two hundred pounds or more.

RACCOON - The Raccoon is quite prominent here and is identified by a black mask and ringed-tail. It is considered to be known as one of the best known Eastern mammals. It feeds on rodents, insects, frogs, wild fruit and corn; and it washes almost all its food when near water. The den is most often a hollow tree where three to six young are born in the springtime. These young are blind for about three weeks and they remain in their den for two months or so. They live with their parents for almost a year, or until the next spring. They are curious little fellows, mischievous, but make fair pets. Coons, as they are commonly called, have been classified as predators by many authorities; however, constant study here on our reservation does not indicate the coon is a serious destroyer of game birds and animals, although occasionally some are included in their diet.

The general habitat of the coon is open woodland but they are common visitors to nearly every type of habitat and being especially fond of corn, they often raid corn fields. As a rule they will restrict themselves to timbered areas, but they generally live in close connection with man's activities.

RABBITS - There are plenty of these creatures at Camp Lejeune. The rabbit family consists of pikas, hares and rabbits. We have mostly the Eastern cotton-tail and a few marsh rabbits which are about the same size. Cotton-tails are classified as true rabbits, their eyes are dark, their legs and ears are short and nearly all have "cotton-tails", hence their name. They are about eleven to seventeen inches long and weigh from two to four pounds when fully grown. Litters average four or five naked, blind babies, which are big enough to leave their nest in about two weeks, leave their mother in less than two months and mature in six months. Several litters a year are common.

Most persons believe that rabbits are rodents, but this is not true. Rabbits all have four sharp, curved incisors in the upper jaw, while rodents have only two. Rabbits are browsing animals, feeding chiefly upon twigs, bark, leaves, grasses, fruit, corn, buds and low broadleaf shrubs and weeds. Rabbits make good use of winter green plots.

Cover is one of the most important factors for rabbits because they have many, many enemies from the moment they are born. Dogs, cats, foxes, skunks, crows, hawks, owls and large snakes are but a few of the natural enemies of rabbits.

Rabbit hunters will generally find that rabbits are most often found within or near dense cover such as honeysuckle, greenbriers and blackberry patches. They are dependent upon their explosive flight when threatened and will quite often seek refuge in some dense thicket or burrow of any kind. Cotton-tails seldom roam over an area greater than a few acres and they do not roam widely in their search for food and cover.

Here at Camp Lejeune, we consider the cotton-tail as one of our most important game animals and they afford immeasurable pleasure to those who enjoy running beagle dogs and hunting this elusive, fleetfooted and palatable little creature.

SQUIRREL - The Squirrel family is a large and diverse group including ground as well as tree species. All Squirrels have bushy or at least furry tails and well rounded heads. Here at Camp Lejeune we are concerned primarily with gray squirrels and fox squirrels, both of which are tree species. Gray squirrels and fox squirrels do not hibernate like ground squirrels do. They build their nests in forks of trees or in tree cavities. Gray squirrels usually have from four to six young born in each litter. Fox squirrels, as a rule, have two litters per year of two to five per litter.

Squirrels are rodents and their large, sharp incisor teeth are well adapted to cutting hard shells of nuts upon which they feed extensively. Also included in their diet are buds, fruits (both native and cultivated), berries, grains and an occasional insect. Both the gray and the fox squirrel abound in the hardwood type forests because they prefer the nuts and acorns which these trees produce.

The fox squirrel is a little larger than the gray squirrel, and unlike the latter, the fox squirrel is not polygamous--it takes a mate for life and they use the same den year after year. Furthermore, as a rule, if the mate is killed, the other does not usually remate.

BOBCAT - The Bobcat, aptly called wildcat, is a small fearless hunter that may attack animals many times its size and is common to our reservation. It usually feeds on rabbits, squirrels, mice and birds. The Bobcat prefers hunting on the ground, although it can and does climb trees. This wary animal is rarely seen and it dens in hollow trees or other protected places. Two to four young are born late in the spring and stay with their mother until fall. By the time they are ready to leave their mother, they can hunt by themselves. Their length is up to three feet, weight is about twenty-five pounds.

FOX - The Fox or dog family comprises widespread familiar carnivores found the world over. Here at Camp Lejeune we have what is commonly called the Gray Fox and a few Red Fox. Foxes have five toes on their front feet and usually four on their hind feet. Unlike cats, they cannot retract their claws. The Gray Fox feeds on rodents, other small mammals, especially rabbits, birds and occasionally fruits and berries. It reaches a length of about three feet. They build their dens in banks, hollow logs or heavy brush. The Gray Fox occupies a diversified habitat. It prefers rolling farmland, wooded areas, marshes and streams. They will climb trees and when pursued by dogs will not make the wide, characteristic, sweeping circle of the Red Fox but will take immediate cover in a tree or underground retreat.

About five young are born late in spring and both parents care for their young and teach them to hunt. By late fall or early winter the young are ready to take care of themselves.

MINK - There are many mink here for they abound by the water and marshes. Mink are aggressive little hunters with a special taste for muskrat, sometimes destroying entire colonies. They also eat fish, marsh birds, quail, poultry and other small mammals. Mink are constantly on the go, carrying their young by the scruff of the neck on land or pickaback in water. When angry, mink discharge an acrid smell and spit or squeal with rage. They bear five or six young in each litter about the size of peapods at birth and are covered with fine whitish hairs. Length about twenty inches, weight about two pounds when full grown, female slightly smaller.

MUSKRAT - These well known rodents do not thrive here on our reservation too extensively because both the Mink and Otter tend to keep the population pretty well depleted. Muskrats build large houses in shallow water or burrow into stream banks. Their diet consists mainly of cattails and other swamp plants, clams and fish. Average length is about two feet with their slightly flattened ten inch tail.

OPOSSUM - Opossum is our only native marsupial or pouched mammal. Camp Lejeune boasts of many. Baby Opossums, which weigh only one-fifteenth of an ounce at birth, live in the mother's fur-lined pouch about three months. Up to fourteen are born occasionally. However, as a rule, only seven to nine survive. Opossum hunt at night for small birds and mammals. They eat eggs and fruit also. When threatened by enemies, they "play possum" and collapse as if dead. Opossums are recognized by their white faces, coarse fur and rat-like tails. Length about thirty-three inches.

OTTER - We have what is called the River Otter on our reservation in abundant quantities and some of them become quite tame. Otters are a fun-loving animal--they chase one another, wrestle, tumble and slide down stream banks. They are excellent swimmers and usually travel by water but will move overland if necessary. They live on small fish, snails, crayfish, insects, frogs, snakes and are especially fond of muskrats. A den is made in the stream bank or in the base of a hollow tree. Here the female has two or three pups in the late spring. The young grow slowly and stay with the mother until early spring of the following year. During this time they learn to swim and hunt. The young play together or with their mother. Their fur is warm and remarkably thick and the young make fine pets. Otters here at Camp Lejeune grow to as much as six feet in length.

SKUNK - Skunks belong to the weasel family and many abound here at Camp Lejeune. All members of the family have scent glands but those of the skunk are the most powerful. Striped Skunk, which are common to this area, with its two white stripes down the back, is a source of endless jokes because it squirts a smelly fluid from scent glands under its tail. However, it gives fair warning before "firing" by stamping forefeet, hissing and raising its hair. This very common Skunk lives in woodland borders, fence rows and open fields. It hunts at night for mice, rats and other small mammals, lizards, snakes and all kinds of insects. The young, three to eight, are born blind in a burrow. They grow rapidly. If de-scented, the young make excellent pets. Length up to about three feet.

C. BIRDS

DOVE - Here at Camp Lejeune we have many Mourning Dove. They are becoming increasingly popular as a game bird and are hunted extensively. The Mourning Dove is migratory in nature and winters in the Southern portion of the United States. It is in these Southern states that most of the doves are killed. During the month of October, as a rule, you can see the fall migration of the doves as they pass through our reservation.

The food of the Mourning Dove is nearly one hundred percent plant material, although slight traces of insect or animal food has been found in the food habit studies. The dove is attracted to corn fields and it is around such fields that many hunters find excellent pastime shooting at the swiftly flying and elusive birds. Wheat, buckwheat and other grain fields as well as ragweed and polkweed patches are attractive to the Mourning Dove.

Doves nest in trees in flimsily constructed nests, generally not too high off the ground. They lay two eggs per clutch and usually raise two broods per year. The white tail border is conspicuous in flight and their melancholy call is very common, hence the name. Length eleven to thirteen inches. The female is duller, with a shorter tail.

QUAIL - Unlike the Dove, the Quail is a permanent resident in its range area; however, like the dove, it is very common to Camp Lejeune. Everyone knows the Bobwhite's call, but these small quail are hard to see in dead grass and weeds. Their size, ruddy color and stubby appearance make Bobwhites easy to identify. Bobwhite Quail (*Colinus Virginianus*) were on hand to greet the first white settlers arriving on the shores of what is now the State of North Carolina. It is doubtful that they occurred in numbers then comparable to present day populations. History tells us much of this area was originally covered by dense forest. Since the natural habitat of the Bobwhite Quail is found where two distinct vegetative types meet and form an edge, as woodland and open field, it is logical to assume that the primitive conditions of that area were not conducive to large quail populations. As civilization's frontier moved westward and farms were carved from the wilderness, Bobwhite's environment was improved and greatly expanded. Crude farming methods employed by the pioneers produced ideal Quail habitat because the early settlers found deer, wild turkey and other large species more practical sources of food. Quail multiplied rapidly under these favorable conditions. When agricultural development reached the point where domesticated animals replaced game as a staple food, hunting became a sport rather than an economic necessity. Bobwhite's sporting qualities soon elevated him to the top position on the sportsman's list. The Quail supply seemed inexhaustible at that time, nevertheless, a rapid increase in human population soon demanded more intensive and extensive use of land for crop and livestock production. This economic trend brought about a progressive decrease in suitable Quail habitat. Ever increasing hunting pleasure and other factors also contributed to the decline in Quail numbers, and as a result deep inroads have been made into Carolina's once bountiful Quail population.

Traditionally, the Bobwhite Quail is a tenant of agricultural lands and is perhaps more socially inclined toward man than any other game species of wildlife. His preferred habitat occurs in greatest

abundance on average farmland, and he is content to go about his daily routine in close proximity to man and normal farming activities. Bobwhite's favorite haunts are woodland borders, bushy fence rows, weed fields and open sunny woodlands. Here such natural foods as insect life, weed seeds and waste grain from cultivated crops are found. These sites usually provide, or are near, dense cover into which quail may escape from their natural enemies. The Bobwhite Quail is strictly monogamous in the wild state. The first warm days of spring find birds beginning to pair off and disperse in search of range suitable for nesting and rearing their young. Both the male and female birds are devoted parents and share the task of nest building, incubating the eggs and caring for the chicks after they are hatched. If the first clutch of eggs is destroyed, the mated pair will make repeated attempts to nest until they succeed in producing a brood of young. However, if the first nest is successful, the parent birds devote the remainder of the season to rearing the brood. There is no authentic record of Bobwhite Quail producing two or more broods of young in one season. Quail chicks are very active almost immediately after hatching, and are soon able to forage for food under the guidance of the parent birds. The family group usually remains intact through the summer and early fall, seldom ranging more than one-half mile from the nesting site if the environment provides the necessities of life. With the advent of cool weather, however, two or more families may combine to form a covey and become established on a winter range. In areas where Quail habitat is of a poor quality, a single covey found in fall or winter may contain the remnants of all broods reared on a sizable tract of land, plus unsuccessful pairs of breeders and individual birds unable to find mates during the previous breeding season. After the coveys are formed and established on a winter range, there is generally little inter-mingling of groups. However, if during the winter months coveys are drastically reduced in numbers by excessive hunting, predation, or other means, regrouping may occur. Therefore, large coveys found in late winter and early spring may represent the total Quail population of an extensive area.

Quail populations may be seriously effected if adverse weather conditions prevail at critical periods during the year. Excessive rainfall in spring and early summer destroys many nests. A high rate of mortality among juvenile Quail often results when prolonged rainy and cool periods occur during the rearing season. Drought retards the development of cover and causes serious shortages in the supply of natural quail foods. Adult quail are well equipped to cope with average North Carolina winter conditions if food and cover are available in adequate quantities.

A year around supply of food is the factor which should be given first consideration in managing Bobwhite Quail in this area of Camp Lejeune. Such natural foods as insects, berries, succulent greens, grasses and weed seeds are usually available in adequate quantities from mid-spring through the fall months. As winter approaches, food becomes scarcer. In late winter and early spring, food supplies are

often depleted to the point where Quail must range far from protective cover to obtain even the poorer quality foods. It must be remembered that because the reproductive potential of Bobwhite Quail is influenced by their winter diet, a dependable supply of high quality winter food is of paramount importance in building and maintaining Quail populations. Field borders and odd plots of land planted in perennial Lespedeza Bicolor assures an adequate supply of winter food.

Quail requires various types of cover for nesting, loitering, shelter and protection from their natural enemies. Cover and food should occur in correct relationship, one to the other. Quail cannot safely utilize food located beyond flight range of cover which will afford protection from predators. Cover is not at present a serious Game Management problem here at Camp Lejeune, and if the Game Management Plan is continued in force, there should not be any cover trouble here for many years.

When food and cover are available, and well distributed over the range, Bobwhite Quail are well prepared to cope with predators--if the predatory species occur in normal numbers. Great horned owls, cooper and sharp-shinned hawks are the principal natural enemies of Quail, but stray dogs and cats are usually more detrimental to Quail than normal populations of all the wild predatory species combined. This is one reason that strict law enforcement is a must, because the dogs and cats can become a very dangerous problem to the Game Manager. Let it be remembered that a suitable habitat is Bobwhite's best defense against decimation through predation.

It has been the experience of the Game Protector's here at Camp Lejeune that restocking depleted Quail coverts with artificially propagated birds has been practiced for some years; however, this method of attempting to restore Quail population has met with little success in most instances. Pen-reared birds cannot survive and multiply in environments which have failed to sustain nature-wild-reared quail. If depleted areas are made tenable through habitat restoration, they will soon be populated by wild birds from surrounding territory and restocking will be unnecessary. Stocking with artificially propagated Quail is feasible when suitable habitat occurs, or has been developed in sections where there are no native birds. Stocking is also practicable when conditions warrant augmenting the native population for heavy fall and winter shooting. Length seven to eleven inches, the female is larger than the male but duller in coloring.

TURKEY - The Eastern Wild Turkey (Melagris Gallopavo) is common here on our reservation and probably no other game bird played a more important role in the colonization and early history of this state. Numerous references to the former abundance and utilization of Turkeys can be found in the written accounts of early explorers and settlers.

As pioneers moved westward to the mountain regions, however, several factors combined to gradually decrease Turkey numbers. Suitable Turkey habitat disappeared due to the increased land clearing by agriculture and lumbering while hunting pressure steadily increased. These unfavorable conditions caused the disappearance of Turkeys from most mountain and piedmont counties during the late 1800s and 1900s, while in the coastal plains Turkeys were forced from the better upland range into inferior range in inaccessible bottom land swamps and pocosins.

The color of the gobblers is a coppery-bronze with the feathers margined in black. The body feathers of the gobblers are highly iridescent and refract sunlight in a variety of colors. The plumage of the hen is somewhat duller in color. The Wild Turkey may be distinguished from domestic varieties by the chestnut tips of the tail feathers as compared to the white-tipped tail feathers of the domestic bird. Aside from the minor sex differences in size and coloration, adult gobblers are usually distinguished from hens by the presence of the characteristic "beard". This bristle-like breast appendage is composed of modified feathers, and varies in length from a few inches in young toms to over a foot long in old gobblers. Occasionally, hens possess small, poorly developed beards, but this is a rather uncommon occurrence.

Eyesight and hearing are extremely well developed in the Wild Turkey. Pen-raised male Turkeys have been known to breed successfully during their first year, however, in the wild state they rarely breed until their second year. Possibly the more mature gobblers prevent the younger males from mating, at any rate, yearling gobblers usually keep to themselves during the mating and nesting season. Mating is always preceded by a period of courtship and pairing of sexes. In early spring the gobbling of the toms and the yelping of the hens is generally a sign that mating activities have begun. Upon hearing or seeing a hen, the gobbler begins to strut and drum in an impressive fashion. The wings are partially spread along the sides and the wing tips scrape the ground at intervals as the birds strut. The body feathers are ruffled, making the birds appear twice their normal size and the head is drawn back and down below the level of the back. The Wild Turkey is polygamous and gobblers try to acquire a harem of as many hens as possible. This harem averages from four to five hens, although the gobbler may be capable of serving more than that number. This polygamous breeding habit of the Wild Turkey is the principal reason for the present law permitting the kill of gobblers only. Since an equal number of males and females are produced each year and since the average gobbler serves four or five hens, it can readily be seen that the majority of gobblers may be harvested each year without hurting Turkey production. On the other hand, every hen that is killed represents a potential loss of several Turkeys for the next season.

Turkey nests are built on the ground and are usually carefully hidden under a shrub, a fallen tree or some other type of cover. Open woodlands, usually near a water supply, are most often selected as nesting sites. Once the nest has been established, the hen begins laying eggs until ten to eighteen have been laid. The incubation period is twenty-eight days, and if the nest is broken up before the eggs hatch, the hen will usually attempt to re-nest until a brood is hatched successfully. This fact accounts for young poults being observed during the fall hunting season and is not as some persons believe, an indication that more than one brood has been raised during the year. The gobble Turkey has been known to hatch the eggs when the hen has been killed or fails to return to the nest. The tom Turkey will also raise the young ones after being hatched. Weather conditions are a rather important factor in the survival of the young in the tidewater counties. Floods and hurricanes frequently have detrimental effects on the Wild Turkey population on the flood plains of the Camp Lejeune reservation. Hurricanes cause severe nesting losses at times and summer and fall floods destroy food supplies and habitat. Hurricanes cause flooding and as a result the Turkeys will seek higher ground, thus concentrating them on small areas of high ground and increasing possibilities of disease and predation. These floods also force Turkeys out of the swamp forests into the uplands where they are more easily killed by hunters.

A diversified type of habitat is necessary to provide optimum condition for Wild Turkeys. A mixed pine-hardwood type of habitat containing at least fifty percent hardwoods, half of which is mast producing oak, constitutes good Turkey range as far as woody vegetation is concerned. Of prime importance, however, are a number of small clearings scattered throughout the forested areas where Turkeys may find grasses, insects and fruits.

The Wild Turkey's chief foods are grasses (both blades and seeds), insects, mast and fruits. In the early spring succulent grasses furnish the most important part of the adult Turkey's diet while the poults feed almost entirely on insects. These foods are supplemented by fruits, seeds and berries during the summer, but by fall various types of mast including acorns, hazelnuts and beechnuts become the most important food item. The chestnut, which was once one of the important Turkey foods, has become practically extinct here on the Camp Lejeune reservation. As winter approaches and food becomes more scarce, Turkeys are forced to seek food by scratching in the forest's litter for mast and also insects which are found in considerable numbers under decaying leaves and other vegetable matter.

The primitive agriculture that was practiced by the Indians and early settlers aided the Turkey by creating small clearings in the virgin forest. As agriculture expanded, land clearing steadily

decreased the amount of suitable Turkey range and even today, agricultural foods still supplement the Turkey's natural foods in practically all regions of North Carolina. In general, it may be said, that while intensive agriculture is detrimental to Turkeys, limited agriculture in the form of small fields scattered throughout wooded areas is beneficial.

Grazing of woodlots by livestock is detrimental to Turkeys since practically all these domestic animals compete with the Turkey for food. Most of this competition is for grasses which form a very important source of Turkey food. Intensive timber cutting is one of the most important factors causing decreases in Turkeys. Wholesale removal of all types of marketable timber together with unrestricted hunting will result in the extermination of Turkey from their ranges. The Forestry Management here at Camp Lejeune calls for "clean-cutting" on small areas which is beneficial to Turkeys for a short time since these areas at first support rich growths of native grasses and other food plants. Within two or three years, however, these areas become useless as hardwood and pine reproduction and perennial weeds take over in the course of plant succession.

It should be noted here that a system of cutting and clearing has a definite part in any Turkey management program since clearings are a necessary requirement of good Turkey range, but plant succession must be controlled if these clearings are to provide maximum benefits.

Management of Turkey ranges here at Camp Lejeune reservation consists of locating suitable sites, establishment and maintenance of clearings, planting of food patches, predator control where necessary, and protection from illegal hunting as sponsored by the Base Game Protection Section, Camp Lejeune, N. C.

Spring plantings generally consist of such summer foods as german or brown-top millet, chufas, soybeans, field peas or milo maize. These summer foods are not as valuable, however, as are winter cover crops such as oats, wheat or rye and are probably not necessary once a dense sod of grass is developed. It has been proven here at our reservation that establishment of small plots of permanent pasture mixtures such as Ladino Clover and Fescue will eliminate the necessity of repeating fall plantings of wheat or rye. The planting of one percent of a managed area to winter cover crops or permanent pasture is adequate and individual plantings need not exceed two acres.

Predation has its greatest effect on Turkey population during the nesting seasons and while poults are still quite small. The Bobcat is usually the only predator that the Turkey must evade since he can catch

and kill the Turkey. However, complete removal of the larger predators, such as Foxes and Bobcats, is not advisable since this could result in greatly increased competition for food by buffer species such as song-birds, field mice and other rodents. Nest predators such as raccoons, opossums, skunks and crows sometimes require varying amounts of control depending on their relative abundance.

Wherever Turkey Management is being carried on, protection from illegal hunting is an absolute necessity until the population reaches the point where there is harvestable surplus. The killing of gobblers only, and control of that kill, will assure a sufficient breeding stock for the next season.

The writer wishes to enumerate some of the experiences of artificial propagation and restocking experienced here at Camp Lejeune. Pen-raised birds have been found to possess few of the attributes of the Wild Turkey and soon after release, many of these Turkeys would be found in nearby farm yards mingling with domestic fowl. Some of these Turkeys were easy marks for poachers and many of them were killed soon after release. Predators took an additional toll and since pen-raised birds lacked the native vigor or vitality of wild ones, disease may also have been an important factor.

Restocking of depleted areas may best be accomplished by using live trapped native birds. One of the principal objectives of the present Turkey refuge system is to produce a trapable surplus which can be used for restocking suitable areas which do not have Turkeys. This method, we believe, can be made to good avail here at Camp Lejeune.

The adult gobbler attains a total height to the top of the head of about forty-five inches and weighs over twenty pounds. The hen is a little smaller, being about thirty to thirty-six inches high and about ten to fifteen pounds. The present range of our Turkey is pretty much confined to sandy areas where Pine and Oak trees abound although the population is becoming steadily less and less, mainly due to maneuvering troops, the establishment of firing ranges and the increase of impact areas.

WOODCOCK - At the head of the Snipe family list is the American Woodcock. Many are observed on our reservation here at Camp Lejeune. Few birds have so many good points as this, it is pre-eminently a game bird in every sense of the term, demanding all of the skill of the hunter and being unexcelled in the quality of its flesh. It is one of the earliest arrivals in the spring and the return flight is not completed until late in autumn.

The Woodcock is slightly larger than the Bobwhite Quail. It is sort of an oddity in the bird world because of its heavy long bill, short neck and plump body. The bill is very fascinating in that it is hinged on the end as an aid in grasping earthworms deep underground. Also, its large eyes are set far back in the head giving it a most unusual look. Nature has given this bird an excellent camouflage protection, consequently they are often approached to within a few feet and are not observed until flushed.

The Woodcock's diet consists of about nine-tenths animal food, two-thirds of which is made up of earthworms. The remainder of its food is made up of flies, beetles, caterpillars, crustaceans, millipeds, centipedes and spiders. They also eat a small quantity of seeds and grain. The male Woodcock selects a "singing ground" which it protects from other male Woodcocks. The female is attracted to this "singing ground" and it is here that she constructs her crude nest upon the ground to bring off her young. Length about eight to twelve inches, with the female the larger of the two.

Many non-game birds abound here on the reservation. Some are useful to our Game Management Program, others a menace. To mention a few, we have the Blue Jay, Crow, Hummingbird, Cardinal, Starling, Woodpecker, Mockingbird, Sparrow, Meadowlark, Red-eyed Vireo, Carolina Chickadee, Tufted Titmouse, Owls, Hawks, Purple Martins, Herons, Cranes, Sea Gull and the common Nighthawk. Some of the more important ones are described below:

OWLS - Several varieties of Owls are common here - Screech Owl, Barn Owl and Horned Owl. All are characteristically "Birds of the Night" with keen eyesight and noiseless flight. Colors and size vary somewhat but they all have one thing in common, they feast on rodents and other small mammals. Their size varies from eight inches to about two feet, their colors range from almost white to very dark brown.

HAWKS - Coopers Hawk, Red-Tailed Hawk and the Sparrow Hawk are the most common types we have here. These are typically "Birds of the Woods" and vary from about eight inches to nearly two feet long with the female usually the larger. Like the owl, they too prey on rodents and small mammals but they also devastate small bird clutches and coveys, especially Bobwhite Quail when they can get at them.

BLUE JAY - No other Eastern bird is like the noisy Blue Jay, with its striking blue, black and white color. Plenty of them here at Camp Lejeune, Their length is about twelve inches.

CARDINAL - We have many Cardinals and no other bird resembles it. The Cardinal is the only red bird with a crest. Its heavy red bill, with black around the base, is a good field mark. The light brown female Cardinal has the crest and red bill of the male, but very little of its color. Their length is about seven to nine inches and the female of the species is duller.

STARLING - Introduced into New York in 1890, Starlings have been spreading ever since. They are becoming more and more common here all the time and if not controlled, are likely to become a nuisance and even a pest. Starlings are handsome birds, given to musical song and mimicry. Sunlight on the adult causes the plumage to show a rainbow of colors, though the younger birds are a uniform dark brown. Length about seven and one-half to eight and one-half inches.

D. REPTILES AND AMPHIBIANS

Many Reptiles and Amphibians inhabit our reservation, some are useful and some not so useful in the eyes of the Game Manager and the culmination of his program.

ALLIGATORS - Alligators were once extremely common here although their population seems to be on the downgrade. It is now almost impossible to find one over ten feet long. The female lays thirty to forty eggs in a nest of twigs and decaying plants and guards it until the young are hatched.

FROGS - Several varieties of Frogs are common to our area and they range in size from about one inch to six inches or more.

TURTLES - Turtles are common here and many types are found, including soft-shell. Some of our turtles weigh well over one hundred pounds.

SNAKES - Snakes are very common here, both poisonous and non-poisonous varieties. Most of the snakes are actually harmless to humans, but there are three or four varieties that are extremely poisonous and should be guarded against wherever and whenever possible. As for wildlife management and control, I believe most snakes are beneficial; however, some predation of small game, mammals and fowl does exist. Some snakes lay eggs, others give live birth.

Perhaps the most common poisonous snake in this area is the Rattlesnake, which grows to seven feet, and prefers dry, fairly open land. Then there is the Cottonmouth Water Moccasin, a thick-bodied, flat-headed snake of the swamps and river banks. This snake rarely gets more than five feet long and is considered to be

very dangerous. The most dangerous snake for its size in this area is called the Coral Snake. It is a secretive, burrowing species, red with black rings bordered with yellow, and with a black nose. Do not confuse this snake with the harmless Garter Snake or Scarlet Snake. Remember, the Coral Snake has a black nose and is extremely poisonous. Copperheads are also quite common to our area and they should not be overlooked because they too are very dangerous. Copperheads are generally upland snakes with a coppery head and an "hour glass" design on their backs. They attain a length between four and five feet.

E. FISH

Fish are plentiful here in the waters of our reservation and in the outer banks and ocean as well. Both fresh and salt water fishing is a very popular and satisfying sport for many. To some, fishing is more important than hunting, and sport fishing is almost unequalled in this section of North Carolina. Fish have distinct, precise names just like our mammals do and they, as wildlife, play an important part in the natural environment. Fishes serve as an important source of food for many vertebrates. Shore birds and ocean birds probably consume a much larger quantity than man.

It is odd, but nevertheless true, that fishes which are so plentiful, must have protection and require strict conservation measures. The main peril to fishes is not the fishermen nor the birds we mentioned earlier, but the water pollution caused by sewage and industrial wastes and results of poor farming tactics.

BASS - Basses are often called the finest of fresh water game fish and they include about thirty-odd species. They are members of the Sunfish family and all have a single dorsal fin. Most common here are the Largemouth Bass and Black Bass in fresh water and the Channel Bass and Sea Bass in salt water.

BLUE GILL - One of the larger Sunfishes, sometimes weighing a pound or more, however, the average is much less.

BREAM, ROBBIN AND SPECKLED GILL - These fish are all of the Sunfish family and are quite abundant here. They range in size and weight from six to ten inches and six ounces to eighteen ounces.

PERCH - Fresh water as well as ocean Perch are common to Camp Lejeune, although we are concerned mainly with the fresh water type. These grow to about twelve to fourteen inches when matured.

TROUT - Trout are close relatives of the Salmon and they generally prefer fresh water, although several species return to the sea. When they do, their appearance often changes, causing

sportsmen endless confusion. We have mostly what is known as the Spotted Trout.

FLOUNDER - The Flounder is a flat fish and it has a very unique form. It is a very widespread group and there are more than one hundred and thirty species. This form takes place due to the larvae lying on the bottom. As soon as the larvae begins to change its form, the eyes migrate to one side of the head. The bottom side is white or pale; the top side varies in color and all species can adjust their color and pattern to the bottom on which they live. The Southern Flounder is the most common in this area.

PIKE - Pike is one of a group of long, thin fishes with spineless dorsal fins and large anal fins. They have long, narrow jaws with sharp teeth. They are good eating and considered to be an important game fish.

CHAPTER VIII

CONTROL

Control of a Wildlife Management Program covers a multitude of facets, all of which are related in one way or another. This chapter will discuss briefly the aspects of Law Enforcement, Fire Control and Predator Control.

A. LAW ENFORCEMENT

Law enforcement in connection with Wildlife Management is under the cognizance of the Chief Game Protector, Marine Corps Base. This section is governed by both Federal and State laws as well as by regulations laid down by the Defense Department, Commandant of the Marine Corps and the Commanding General, Marine Corps Base, Camp Lejeune.

The Base Game Protector and his assistants are constantly on the lookout for violators, and if and when apprehended, they are turned over to the Base Provost Marshal for proper processing as required.

Aside from strict law enforcement as outlined, areas that have been planted and cultivated to further enhance wildlife propagation and perpetuation should be plainly posted and occasionally patrolled to assure that unauthorized personnel (especially maneuvering troops) are not allowed to trespass. Trespassing in an unwanton manner is indeed a very serious menace to the Wildlife Program.

B. FIRE CONTROL

Just as forest control is compatible and necessary to Wildlife Management, so is fire control vital to forest control and the Wildlife Program. Fire control on the Camp Lejeune reservation consists of three phases - presuppression, detection and suppression.

Presuppression simply means action taken or required to prevent fires from starting or spreading. The main facet of this is construction and maintenance of fire breaks and secondary roads. Another facet is controlled burning. We have over two hundred miles of fire breaks and secondary roads which we maintain on an "as needed" basis. Controlled burning consists of burning off firing ranges, impact areas and other forested areas under strict supervision and in accordance with a plan. This burning is done in the winter when all

vegetation is dormant. Slight damage is done to the growing timber while the rough is greatly reduced. Likewise, this is done at a period when injury or death to wild game will be kept at a minimum. In removing this rough, it is then possible for small herbaceous plants to come in which provide excellent game food.

Detection, of course, means simply what the word implies. We have three fire lookout towers on the base, all of which are equipped with two-way voice radios and are manned seven days per week the year around, except in rainy weather. When smoke or fire is spotted from a tower, an azimuth reading is taken and immediately called in to the Fire Dispatcher. With two or more azimuth readings, the Fire Dispatcher is then able to plot and locate the exact area of the smoke or fire. Necessary action, of course, is immediately taken.

Suppression of fire is the responsibility of the Base Fire Department. When a fire is reported and located, the Fire Dispatcher dispatches a crew to the fire. Their equipment is basically hand tools and a heavy, pumper type truck. If more equipment is required, tractor-drawn fire plows are dispatched from Base Maintenance. The Base Forester is in charge of presuppression and suppression fire control and directly responsible to the Base Maintenance Officer and Wildlife Manager.

Uncontrolled and careless fires are a serious menace to our Wildlife Management Program and utmost care should be taken at all times to prevent forest fires.

C. PREDATOR CONTROL

While the onslaught of civilization has noticeably affected a great deal of the living habits of animals in many areas, it has not been able to "civilize" their methods of procuring foods. Predators have their place in the normal scheme of things and when present in normal numbers are actually beneficial in many ways. They do, however, frequently increase in numbers to the point where man must lend a hand to nature in order to reduce the population, otherwise desirable game are likely to disappear from a particular area.

Indeed, all animals that prey on one another can be classified as predators. Those which kill insects, reptiles and animals detrimental to man are considered beneficial; those which destroy valuable game food or kill just for the wanton joy of killing, of course, are not always considered beneficial.

Predator destruction (or destruction of any other species for that matter) should not be overdone lest nature's balance will be

thrown out of order. Just as important, if indiscriminate killing of certain species is allowed, extinction of that species is certain.

We practice predator control here at Camp Lejeune quite rarely, and then only on an "as needed" basis and under strict supervision of the Chief Game Protector. The Game Protector's section continually conducts extensive study to control predators and keep them within the required balance. In fact, this past year the section has killed, or otherwise disposed of, five Bobcats, ten Gray Foxes and ten Skunks.

CHAPTER IX

SUMMARY

The report made here in this edition has been designed to familiarize personnel interested in Wildlife Management with various plants and animals indigenous to our reservation at Camp Lejeune, North Carolina and to acquaint them with some of the aspects and requirements related thereto.

Information contained herein has come from many sources, including our own practical experience right here on our reservation. Some authorities differ slightly on certain details as pertains to wildlife and wildlife management; however, they all have one thing in common - the end result - a good, sound and well conceived management plan.

All living things have a life cycle or pattern. At certain times, forces within the organism determine when the species should prosper or decline. Conversely, forces outside the organism also determine whether or not the species will prosper or decline and remain in the geographical area. When wildlife no longer reproduces freely or cannot find the essentials of life in the area in which they abide, almost certainly they will die or move on to greener pastures. It is herein that a good, sound and well conceived wildlife management plan, properly promulgated, is of utmost value. No plan is good unless it is put into being and given life, just like the wildlife, it is designed to serve. We know from experience that our plan is beneficial and as the seasons go by, the fruits of our labor should be more rewarding.

Of interest to all concerned, some of our wildlife has been miserably infested with our common Tick, especially baby fawns and rabbits. Sportsmen who go into the woods only in winter may not be aware of this problem, but it is a serious one, nonetheless. Take a walk in the spring when the fawns are being dropped and you will see many two to three week old babies gone completely blind by tick infestation in the eyes and ears, only to die if not given some sort of human aid.

These and many other problems confront the Wildlife Manager and his program here at Camp Lejeune. Our animal and vegetable resources are renewable and these resources can and should be restored and perpetuated whenever possible. This we hope to do with our plan. It is then, up to all of us to assist in every way to prevent any exploitation of our wildlife except as provided by our laws and regulations. If this edition of the Wildlife Management Program has enlightened you and helped to provide a better understanding of the complexities of wildlife, then truly it has served a useful and gratifying purpose.

